Coal Age

APRIL, 1947

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DETROIT

★ CUTTING COAL COST... p. 82

CONFIDENCE... how much is it worth

IN 1844, three years before Alexander Graham Bell was born, and long before the first Prairie-Schooner crossed the Mississippi River, John August Roebling's confidence in the suspension principle of construction so impressed the engineers of the State of Pennsylvania, that they authorized him to build the world's first suspension aqueduct.

How much is his confidence worth to all the thousands of engineers who followed and to humanity in general that have benefited from his pioneering venture?

And how much is the confidence of the John A. Roebling's Sons Company in the future of American industry worth to you, that keeps Roebling development and Roebling products in the lead?

Roebling's greatest asset is your confidence in Roebling and its confidence in your future. That is why Roebling's every effort is dedicated to the preservation of this confidence—your's and Roebling's.

For performance—mining men turn with confidence to Roebling Mining Cables

As with any product, the final test of Roebling Mining Cables is performance. But the confidence with which mining men specify Roebling cables means their performance can be predicted—in advance.

A typical example is Roebling Roeclad Portable Cable, widely used on portable mining equipment. It's made of the finest available materials... in single or multiple conductors... in a wide range of sizes... with or without ground wires. It's soundly designed and engineered to resist impact and crushing. It is the best Roebling knows how to make.

And not only the cable commands your confidence, for at Roebling product and service go hand in hand. Experienced engineering service will help you get *all* the dependability and long life you pay for. Just call our nearest branch office and talk to your Roebling Field Engineer.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

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ROEBLING

A CENTURY OF CONFIDENCE

An "underground movement" that is 8 years old

A typical example of B. F. Goodrich product development

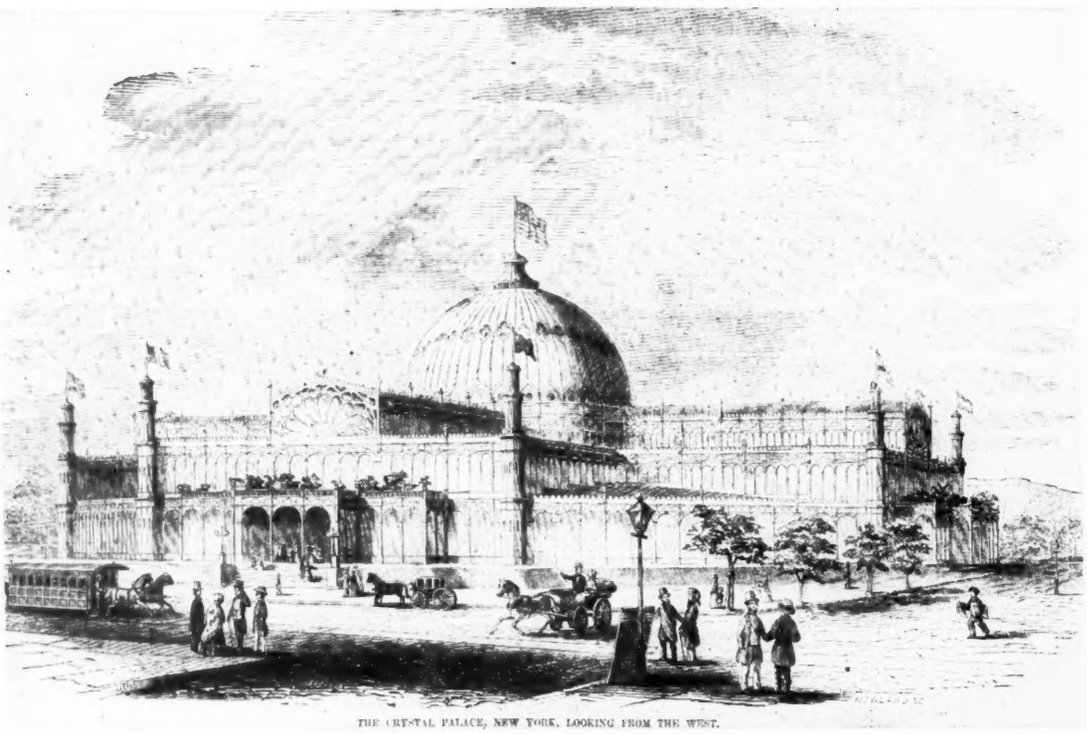
MINE cars aren't much good in a mine where the seam of coal is thin. To make room for the cars you have to blast and haul out more rock than coal. And that's costly. So for many years a lot of good coal never saw the light of day.

Conveyor belts were obviously the answer. But, to stand the pull of carrying thousands of tons of coal over long distances, the belts had to be made so heavy and stiff that they wouldn't form a trough except when loaded with coal. But belts run empty part of the time. Then they flatten out, climb the rollers and tear themselves to death.

A few years ago B. F. Goodrich engineers developed a new kind of conveyor belt for heavy duty service. It's made of individual lengthwise cords surrounded by rubber to cushion heavy shocks. But it's light and extremely flexible. Eight years ago one of these cord belts was placed in service in a West Virginia mine. It proved to be the perfect answer for underground mining. It stood the impact of large lumps of coal yet formed a perfect trough and stayed on the rollers even when the belt was empty. That first belt is still in service — along with hundreds of others which have been installed since. It's a typical example of the B. F. Goodrich product development that has brought efficiency and economy to every part of American industry. *The B.F.Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

First in its Field....



THE CRYSTAL PALACE, NEW YORK, LOOKING FROM THE WEST.

THE DADDY OF AMERICAN
INDUSTRIAL EXPOSITIONS

Here is the famous "Crystal Palace," the first Industrial Exposition ever held. Erected in New York City in 1853, at Reservoir Square, 40th to 42nd Street between Fifth and Sixth Avenues. Two stories high, it contained 249,691 square feet. All European Nations sent Exhibits. It was opened by President Franklin Pierce on July 14. To prove that its advanced and seemingly "flimsy" construction was safe, a regiment of soldiers was marched through the galleries, before admitting the public.

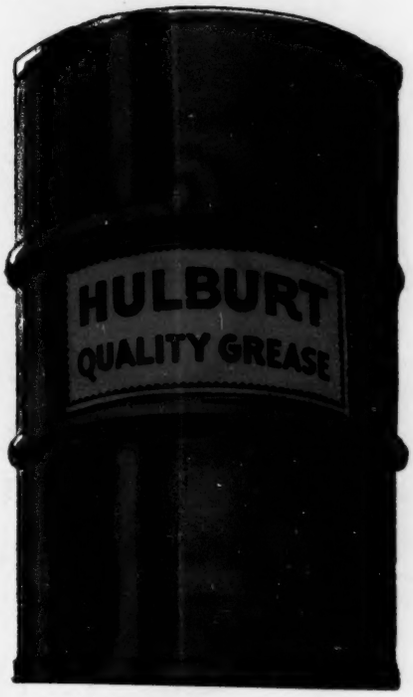
It's as clear as crystal to really experienced coal mine operators that **HULBURT QUALITY GREASE** is "Exhibit A" when it comes to the proper lubrication of Coal Mining Machinery. Just one **HULBURT LUBRICATION ENGINEER** (not a regiment) working right down in your mine, will quickly prove the safety and the economy and the profit and the better operation you get, when your coal mine machinery is lubricated with **HULBURT QUALITY GREASE.**

HULBURT OIL & GREASE COMPANY — PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

...a record of

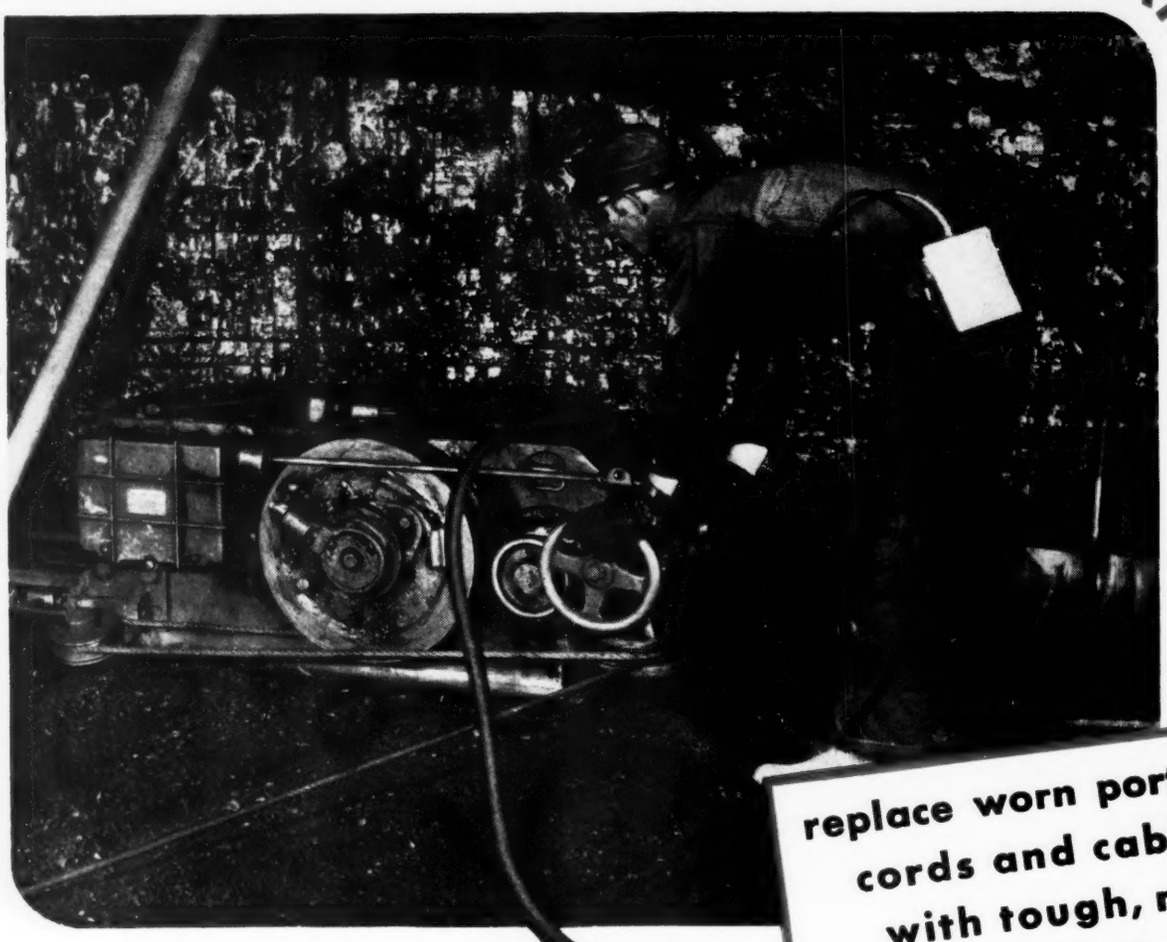
American Leadership



HULBURT *Quality* GREASE

THE "FIRST NAME" IN

HOW TO PREVENT PRODUCTION LEAKS



replace worn portable cords and cables with tough, new HAZACORD NOW

With the terrific punishment that most portable mining cables take daily, a check on their condition may uncover some "weak sisters" that should be replaced before they put a crimp in production.

Hazard offers you reasonably prompt delivery of that tough Hazacord portable cord and cable that has established such outstanding records in mine after mine for long, trouble-free service. For Hazacord portable cords — from the smallest to the largest — are pressure cured in continuous metal molds. It's this Hazard process that provides extra jacket density . . . extra surface smoothness . . . extra all around resistance to mechanical damage.

And all Hazacords are now furnished with a Hazaprene jacket that resists oil, grease, water, chemicals and flame (Penna. Bureau of Mines Approval No. 104). Your nearest Hazard representative will be glad to assist you in keeping electrical power flowing. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Penna.

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HAZARD

insulated wires and cables for every mining use

Coal Age

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Kentucky to West Virginia on a Continental Conveyor

200 Tons an Hour of Run-of-mine Coal Carried 680 Feet at 200 Feet a Minute

Continental Idlers

A complete line of Troughing, Flat Belt and Picking Table Idlers, Timken or SKF equipped, for belts 14 to 60 inches wide. Also a complete line of accessories, including Trippers, Pulleys, Take-ups, Drives, etc.

Write for Bulletin ID-105

When the Belfry Coal Company opened a new mine in Kentucky, they were faced with the problem of hauling the coal across the Tug River to the C & O Railroad in West Virginia. Many methods were considered, but it soon became apparent to company engineers that a belt conveyor carried on a suspension bridge was the most practical solution.

Continental engineers then designed the system pictured above on which run-of-mine coal is uniformly fed by an apron feeder onto the 36" belt conveyor—sped across the river at 200-FPM to the tipple on the opposite embankment.

This is typical of the manner in which Continental engineering is assisting industry in solving their materials handling problems.

Many industries are taking advantage of our present day stocks to build complete conveyors. Send us your orders or inquiries.

100A

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

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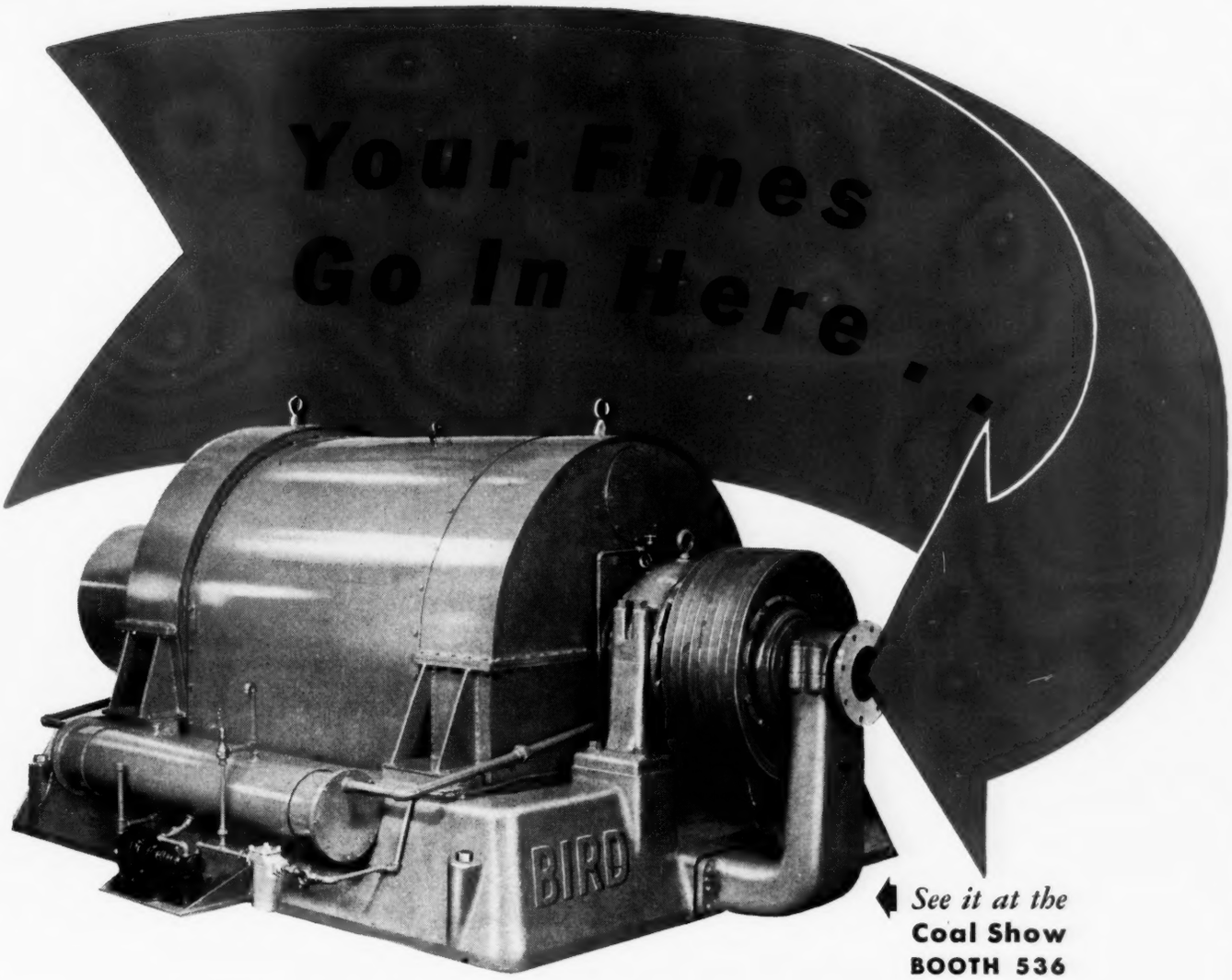


See it at the
Coal Show
BOOTH 536

—and They Come Out Dry and Whole, Ready for Immediate Blending With the Larger Sizes

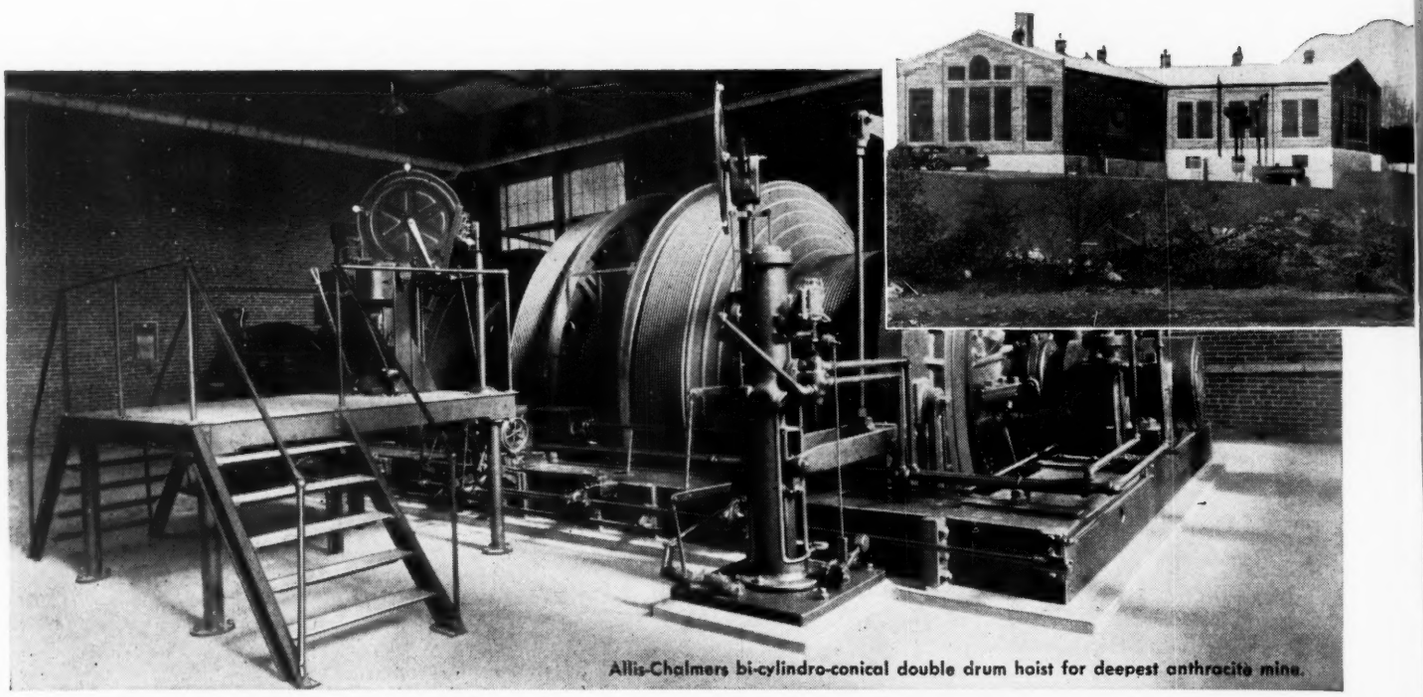
The Bird Centrifugal Filter teams up to perfection with any coal cleaning system. A dilute feed can be handled without thickening. The filtered water is so clean it may be used over and over.

The BIRD handles 40 tons or more per hour, *continuously,* without parts replacements or overhaul for months on end.

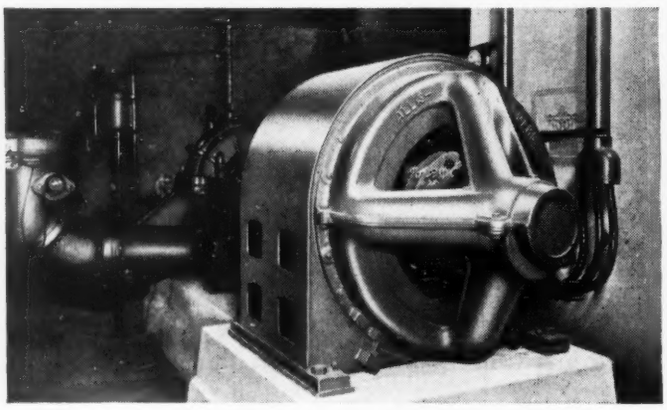
Now is the time to find out what this up-to-the-minute method means to you in terms of net profit. For the whole story, get in touch with *Bird Machine Company,* South Walpole, Massachusetts, or Booth 536 at the A. M. C. Coal Exposition, Cleveland, May 12-15.

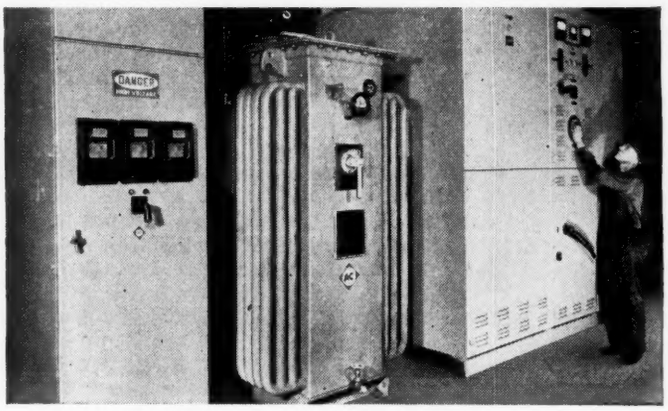
The BIRD *Continuous Centrifugal* **FILTER**

Hoisting Costs



Allis-Chalmers bi-cylindro-conical double drum hoist for deepest anthracite mine.





POWER UTILIZATION

DEPENDABLE POWER for mine drainage is supplied by this 1,000 hp wound rotor induction motor which drives a 9,000 gpm; 360 ft head, single-stage pump in a large coal mine. Allis-Chalmers builds motors for *any* torque and hp requirements . . . with open, enclosed or splash-proof construction. Durability features, such as rigidly fabricated steel stator frame construction . . . statically and dynamically balanced rotors . . . liberally designed bearings and housings result in unusually long motor life.

POWER DISTRIBUTION

IT'S EASY TO INSTALL sealed tube type Excitron rectifiers. Each Excitron unit is completely factory assembled and wired for immediate connection to power supply. Excitron rectifiers have no major rotating parts . . . require minimum attention and maintenance . . . offer high overall power conversion efficiency for d-c voltage regulation over 250 volts. High power factor is almost constant under *all* load conditions. Simple, rugged Allis-Chalmers design means long tube life and thoroughly dependable service.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

Go Down ...JOB RECORDS SHOW

with Allis-Chalmers Electric Hoists and "Regulex" Control

THIS HOIST set a record for economical hoisting in the deepest U. S. anthracite mine . . . resulted in *new low kw per ton costs* for these conditions. Other *hundreds* of Allis-Chalmers hoists—in use throughout the world — prove the soundness of A-C engineering.

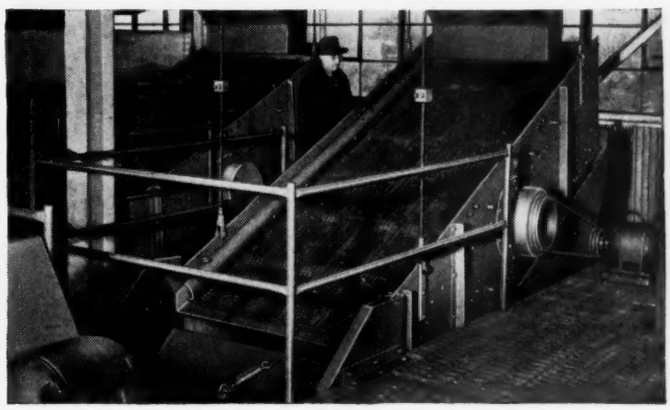
All Allis-Chalmers hoist designs are based on years of experience in working out *cost-lowering* solutions to hoisting problems. And hoisting is only one way in which Allis-Chalmers equipment engineering can help you get increased tonnage at lower cost.

Such products, for example, as the Solids-Handling Pump and the Low-Head Screen with End-Tensioned Deck for coal dewatering have been developed specifically for coal by Allis-Chalmers coal industry specialists.

Find out how Allis-Chalmers equipment can help *you* cut costs. Call the A-C office nearest you. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

CENTRIFUGAL PUMPS

SAVE THREE WAYS with the compact Electrifugal, the Allis-Chalmers pump that costs less to buy . . . to install . . . to operate! Unit shown above is used to recirculate water for coal dewatering in a coal preparation plant. Pump and motor are combined in one "package" . . . Electrifugal pump occupies one-third less space than comparable pumps, and can operate in *any* position. Splash-proof construction. Single or double stage. Sizes ¾ to 25 hp; capacities to 1,600 gpm; heads to 500 ft. **Bulletin B6018.**

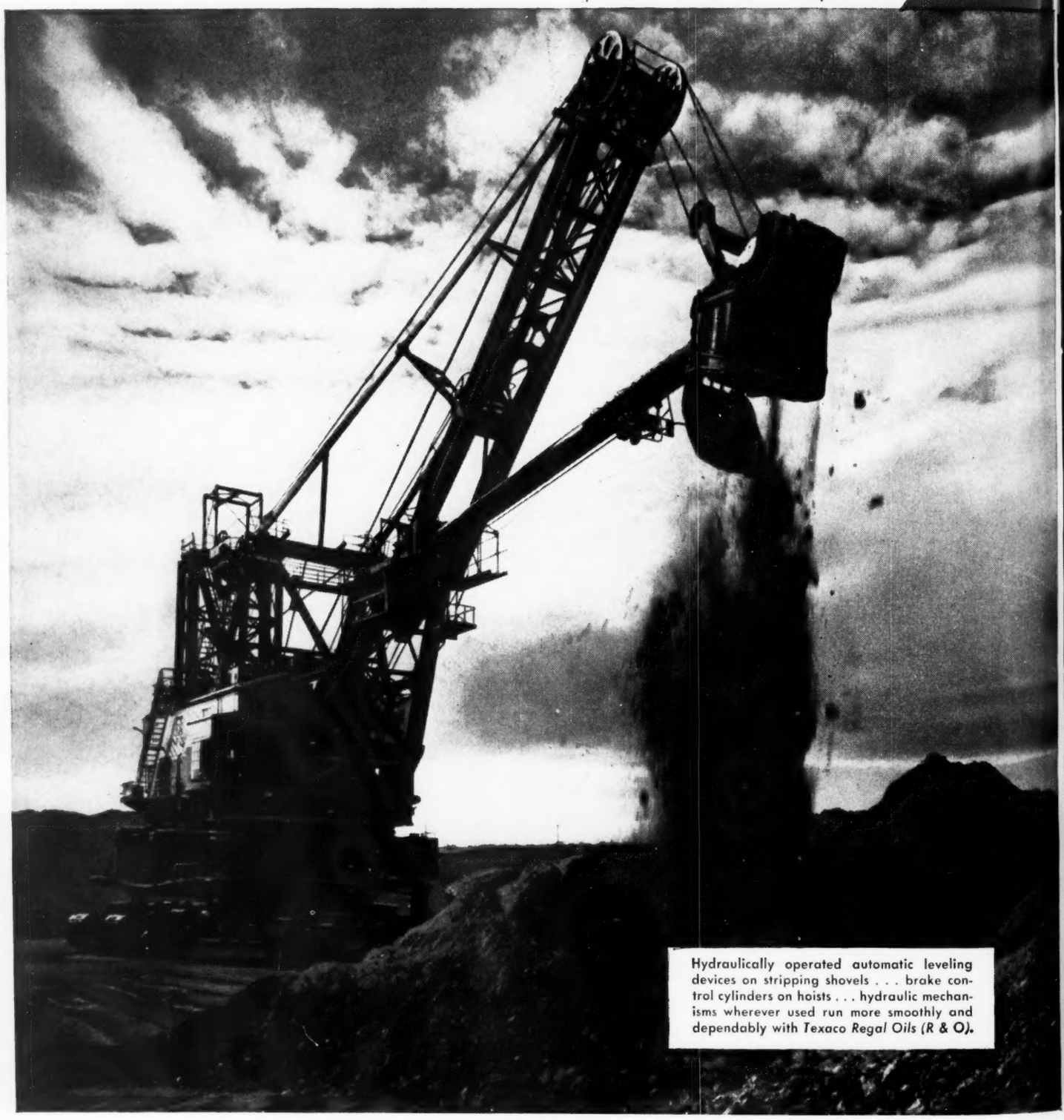


BASIC PROCESSING

CIRCLE THROW action of Riplo-Flo screens results in rapid stratification and more even bed depth of coal on screen, increasing screening capacity. Two 5 by 12 ft Ripl-Flo screens, above, classify washed coal in a large coal tipple. Two-bearing mechanism eliminates outer bearings and support frames . . . makes Ripl-Flo light in weight and low in power requirements . . . greatly reduces vibration. Welded parts "stress-relieved" for uniform, lasting strength. Sizes 3 by 6 to 6 by 16 ft. **Bulletin B6151B.** A 2228

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

...builds for COAL



Hydraulically operated automatic leveling devices on stripping shovels . . . brake control cylinders on hoists . . . hydraulic mechanisms wherever used run more smoothly and dependably with *Texaco Regal Oils (R & O).*

Tune in . . .
TEXACO STAR THEATRE
presents the NEW
TONY MARTIN SHOW
every Sunday night.
See newspaper for
time and station.

TEXACO
REG. T. M.

TEXACO LUBRICANTS

PREVENT *Sludge* AND *Rust* IN ALL YOUR HYDRAULIC SYSTEMS

YOU'LL side-step trouble and expense by keeping your hydraulic mechanisms *on the job longer* with oils that prevent sludge and rust — *Texaco Regal Oils (R & O).*

Texaco Regal Oils (R & O) are ideal turbine grade hydraulic oils designed to prevent sludge and rust — chief causes of hydraulic system stoppages. In addition, they are processed to prevent foaming.

You can get *Texaco Regal Oils (R & O)* in every needed viscosity to assure smooth, trouble-free operation of hydraulic systems of every size. Leading makers of hydraulic equipment either ship their units filled with *Regal Oils (R & O)* or recommend their use.

Texaco Lubrication Engineering Service will gladly assist in the selection and effective use of Lubricants to improve the performance of *all* your machinery. Just call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C,* 135 E. 42nd St., New York 17, N. Y.

TEXACO MAINTENANCE LUBRICATION CHARTS. Leading manufacturers of underground coal mining machinery approve Texaco products for use on cutters, loaders, locomotives, etc., and have cooperated in preparing these charts. Charts show clearly where and when to use the proper Texaco lubricants. Order the charts you need by make and model of each machine.

For the Coal Mining Industry

For long life, high tonnage underground

IT IS well established that belt conveyors are the most efficient and economical method of hauling coal outby—just as long experience proves that Goodyear COAL-FLO belts are your best bet in conveyorizing, on both cost-per-ton and cost-per-year basis.

Best evidence of that is the fact that more mines are equipped with Goodyear COAL-FLO belting than any other brand—for these practical dollars and sense reasons:

1. IT IS LONG-LIVED—more than 90% of the hundreds of thousands of feet of COAL-FLO belting installed in mines is still in

WORKED OUT
WORKED OUT
WORKED OUT
WORKED OUT
Rooms are Usually 250' to 300' Deep
Mother belts in butt entries carry coal from face
1500'-2500'
GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GTM -Specified Plan
for mine 100% conveyorized with Goodyear COAL-FLO Belting
ADVANCING
Grandmother belts in face entries carry coal to slope

—records prove no belting equals

GOODYEAR COAL-FLO

use, much of it with eight years or more service.

2. IT IS MILDEW-INHIBITED, ACID-RESISTING — COAL-FLO belts do not develop cancerous soft spots and carcass rot in mines where damp or acid water conditions are bad, because the carcass is protected by a special mildew inhibitor — because the cover and friction are compounded of tough, acid-neutralizing rubber.

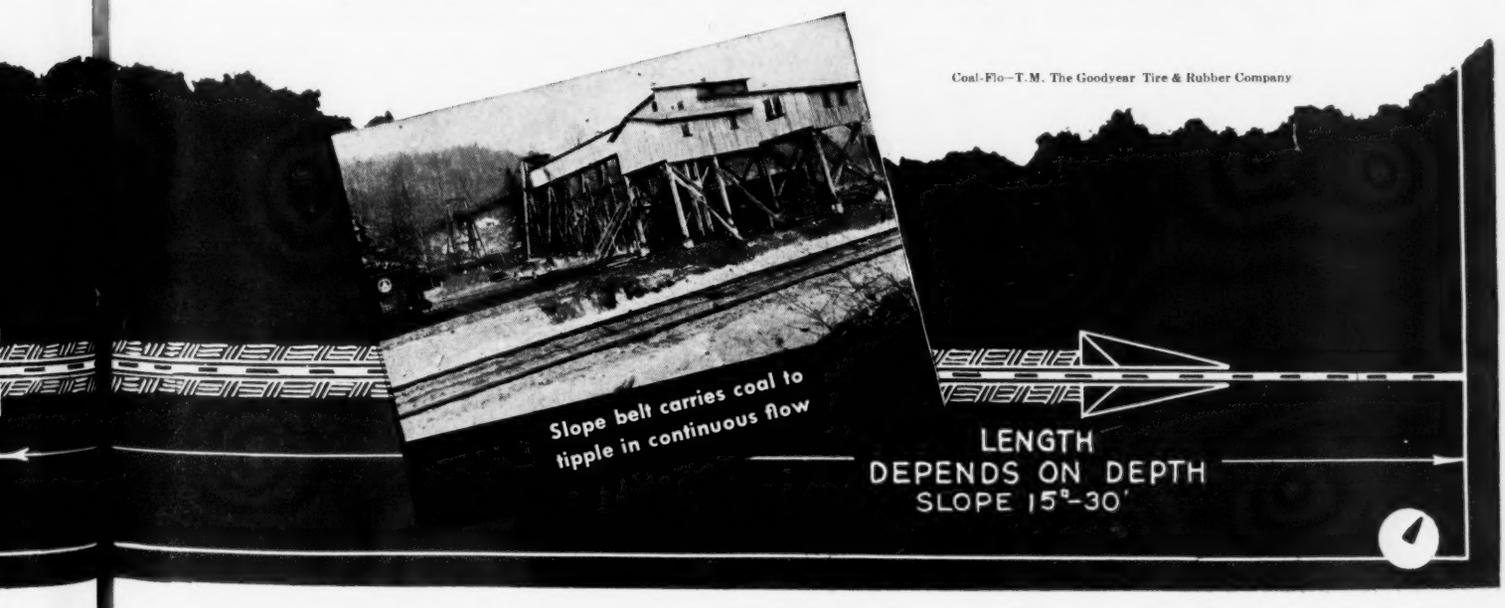
3. IT IS JOB-FITTED — all COAL-FLO belts are specified to the job by the G.T.M.—Goodyear Technical Man — to assure proper troughing for maximum load-carrying capacity and correct, straightline training to prevent edge wear.

Next time you buy conveyor belting, buy by the record and you'll buy Goodyear COAL-FLO belts. The G.T.M. is ready to show you mine records proving important savings with this super-quality belting. To bring him to your office, write: Goodyear, Akron 16, Ohio or Los Angeles 54, California.

. . .

FOR HOSE, BELTS, PACKING, MOLDED GOODS and **TANK LINING** built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

MORE TONS ARE HAULED ON GOODYEAR CONVEYOR BELTING THAN ON ANY OTHER KIND


Coal-Flo—T. M. The Goodyear Tire & Rubber Company
Slope belt carries coal to tipple in continuous flow
LENGTH
DEPENDS ON DEPTH
SLOPE 15°-30°

HIGH GEAR PRODUCTION

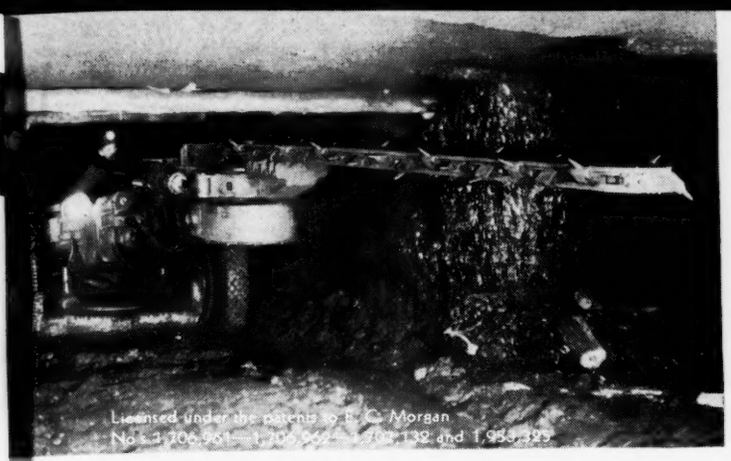
for increased tonnage

JOY MACHINES

work smoothly to produce tonnage faster

- COAL CUTTERS
- LOADERS
- CONVEYORS
- SHUTTLE CARS

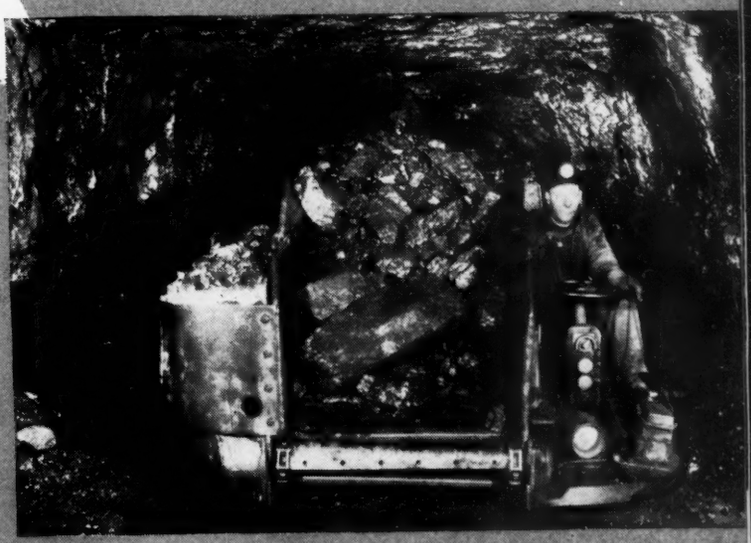
"The World's Most Complete Line of Modern Mining Equipment"



The Sullivan 10-RU is designed for modern trackless mining. Fast tramming, Universal type, with hydraulic controls. Maneuvers easily.

Sullivan 7-AU Track Cutter gives 2 cuts with one laying of track, cuts and shears room necks without turnout switches.

Joy 11-BU Loaders are rated up to 8 tons per minute. Extremely mobile and economical, easy to operate and maneuver.



Joy Shuttle Cars have 4-wheel hydraulic drive and steering, take sharp corners easily. Reversible, finger-tip controls.

Lo-Dal Belt Conveyors give maximum service on any length or type of installation. Room, gathering and haulage types.

JOY TEAMWORK KEEPS COSTS DOWN

Joy machines work together with a smooth, steady efficiency that results in sharply increased tonnage and lowered operating costs. Less labor, less maintenance and less lost time add up to savings that speed the trend to mechanization in modern mines with Joy equipment.

Consult a Joy Engineer

JOY Manufacturing Company

General Offices: Henry W. Oliver Building, Pittsburgh, Pa.

SUN "JOB PROVED" PRODUCTS CUT COSTS, SPEED PRODUCTION, IMPROVE QUALITY

Proof of the value of any industrial product lies in the experience that practical men have had with it. Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of various kinds.

To help you find solutions to problems in any of these fields, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking, without obligation. Telephone your local Sun office, or write Dept. CA4 . . .

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Philadelphia 3, Pa.

"JOB PROVED" PETROLEUM PRODUCTS FOR INDUSTRY

SUN INDUSTRIAL OILS

SOLNUS OILS — Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in the machine tool industry, in air compressors, certain types of Diesels, etc.

SUNVIS OILS — Are in the same category as Solnus Oils with the difference that, in addition, they meet practically all paraffinic and high V.I. oil specifications.

OCNUS OILS — Low carbon-content oils, containing an additive which minimizes oxidation and gives detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse operating conditions.

DYNAVIS OILS — Low pour point inhibited oils which help prevent formation of harmful corrosive and sludge-forming acids. Well-suited for engines fitted with alloy bearings and operated at high temperatures.

SUNTAC OILS — 100% petroleum products which have been treated to increase their adhesiveness. Recommended for general lubrication in all industries where sudden shocks and reversal of loads take place. These oils cling to the parts to be lubricated.

CIRCO OILS — Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNISO REFRIGERATION OILS — Have extremely low pour points and long life stability characteristics. Initially neutral and resistant to formation of detrimental acids under service conditions. The most outstanding oils in the refrigerating and air-conditioning fields.

STEAM CYLINDER OILS — High flash and fire point lubricants for either saturated or superheated steam conditions and for worm gear speed reduction units.

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SUN DELAWARE OILS — Dark oils for general lubrication on older type industrial machinery.

SUNOCO WAY LUBRICANT — Has good metal-wetting and adhesive properties, ample viscosity and E.P. qualities. For use on tableways, as it eliminates chatter and scoring . . . resists corrosion.

SUN MARINE ENGINE OILS — Compounded with special emulsifying agents in order to provide adhesion to and lubrication of working parts in the presence of water. For the lubrication of bearings, eccentrics, cross-heads and various other parts of steam engines.

ROCK DRILL OIL — Heavy-duty adhesive type oil. For use in jack-hammers, stopers and drifters on heavy-duty mining operations.

SUNVIS 900 SERIES TURBINE OILS — High V.I., predominantly paraffinic oils, of uniform 0°F. pour points, containing additives to give high oxidation stability and corrosion resistance under practical operating conditions. Modern oils for turbine and hydraulic systems.

SUN INDUSTRIAL GREASES

SUN CUP GREASES — Water resistant. For grease cup and grease gun application when the service is not severe.

SUN GUN GREASES — Smooth greases made with medium viscosity oil. Stable under pressure in power guns or booster guns.

ADHESIVE PRESSURE GREASES — Won't drip or splash and are excellent lubricants for open gear applications.

SUN DARK PRESSURE-SYSTEM GREASES — For power-driven central grease lubricating systems in heavy industries. Can also be used as a "medium cup grease."

SUN MINE CAR GREASES — Available in several grades. Suitable for both anti-friction bearings and plain bearing cavity-type wheels.

SUN ROLLER BEARING GREASES — For use on electric motors and generators and other high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS — Black adhesive open gear compounds and wire cable greases. Recommended for open gears on metalworking power presses, mining machinery, old reduction mills, crushers, pump gears, etc.

SUN MINING MACHINE LUBRICANT — Semi-fluid. For use where a light but adhesive type grease is required. Free from separation or decomposition.

SUNOCO TRACTOR ROLLER COMPOUND — For miscellaneous parts of caterpillar or crawler-type tracks. Provides good lubrication with exceptional sealing qualities.

SUN METALWORKING OILS

SUNICUT — Straight or non-emulsifiable transparent cutting oils. Recommended for automatic screw machines and for heavy-duty machining operations.

SUN INDUSTRIAL

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion when mixed with water. Sunoco is an efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and non-ferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to develop maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel up to 550°F. Due to their low carbon content and stability under heat, these oils have an unusually long service life.

SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum and brass.

SUN ANTI-RUST COMPOUNDS—Petroleum base oils with chemical additives designed to prevent the rusting and corrosion of steel.

SUN PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" or fine air-borne particles of lint.

SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are not so readily damaged or broken down into harmful dust when this product is used.

SUN CORDAGE OILS—Are adaptable in various formulae used by cordage manufacturers. They are selected products which are highly compatible with additives.

CIRCOSOL—2XH (Rubber Processing)—An elasticator and processing aid for GR-S particularly.

CIRCO LIGHT PROCESS OIL (Rubber Processing)—A processing aid and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber particularly. Used for GR-S to some extent.

SUNDEX 53 (Rubber Processing)—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established outstanding processing aid for footwear rubber stocks.

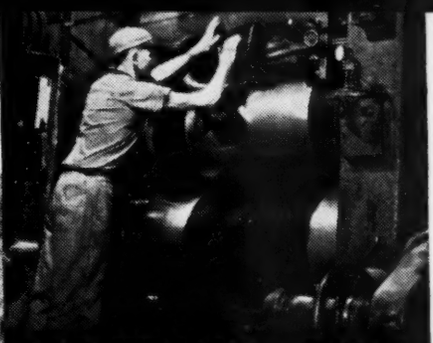
CIRCOMAR-5AA (Rubber Processing)—A black colored product used in reclaiming natural rubber scrap. Used also as substitute for asphalt fluxes in processing natural and GR-S rubber. Free-flowing at room temperature.

SUN LEATHER OILS—Mineral base leather oils. Used for obtaining the desired tensile strength, proper temper and a controlled moisture content. They maintain a light even color . . . mix well . . . distribute evenly.

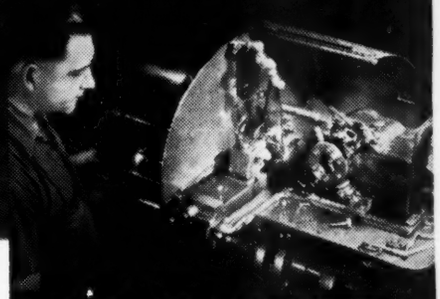
SUN MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SPIRITS—For the thinning of paints, varnishes, and enamels. Also for metal cleaning. This product is a pure water-white petroleum solvent and is free of corrosive sulphur.

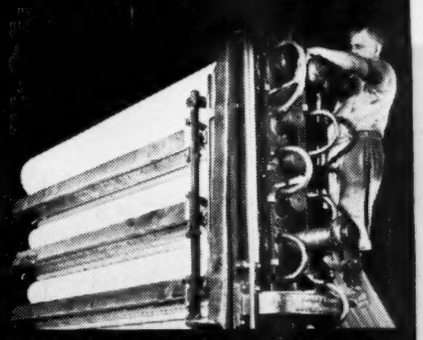
SUN WAXES—Used in packaging, sealing, coating, waterproofing and for numerous manufacturing and chemical processes.



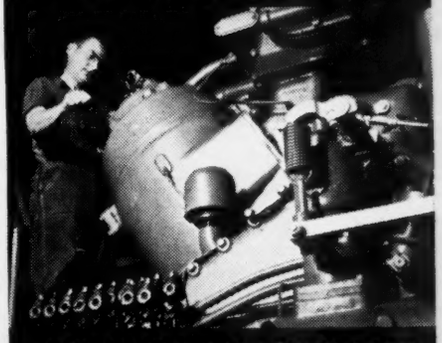
RUBBER MANUFACTURER saved $3,000 a year with a Sun Processing Aid.



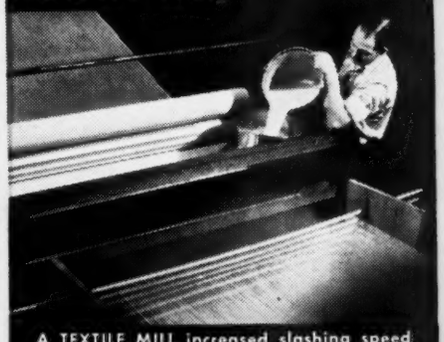
ALUMINUM PARTS MANUFACTURER increased output 43% with Sun Cutting Oil.



PAPER MILL slashed annual lubrication bill $2,874 by using a Sun Grease.



POWER PLANT found Sun Diesel Lubricant lasted 50% longer.



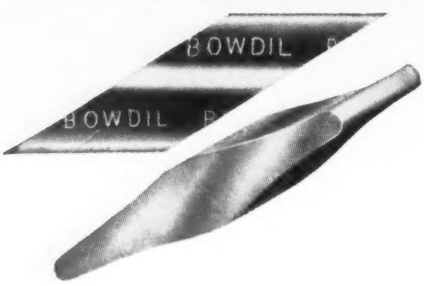
A TEXTILE MILL increased slashing speed 60% by adopting a Sun Processing Oil.

PRODUCTS

SUNOCO

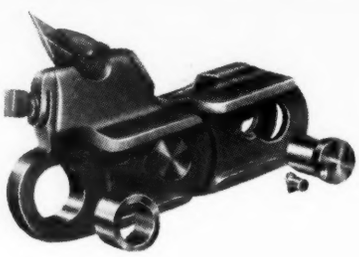
BOWI

AT THE SHOW . . . BOOTH 106



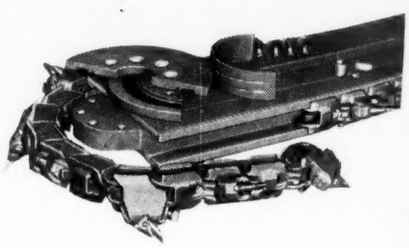
CUTTER BITS

— Heat-treated and specially designed for coarse cutting, Bowdil bits save power—save time—save money. Bowdil bits have 25% more wearing length. Actual operating records in hundreds of mines prove they last 15% to 20% longer than others.



FABRI-FORGED CHAIN

—is rugged—requires less maintenance than other types. Chain circles cutter bar at correct angle because of Bowdil's true-running, radial track guide. Drop-forge lug body stands up under heavy wear —is built for many times the normal load. Chain is easy to connect, remove or replace.



CUTTER BARS

—High physical alloy steels and rivet-free design give Bowdil bars their great strength. Made for coarse cutting, they save power—provide long, trouble-free service. Fit all standard cutting machines.

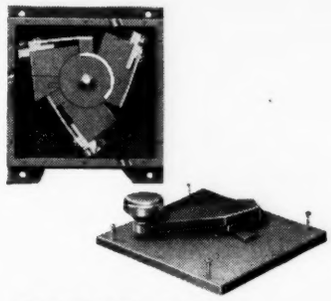
FIELD MEN AND REPRESENTATIVES in West Frankford, Illinois • Whitesburg, Kentucky • Charleroi, Pennsylvania • Denver, Colorado • Williamson, West Virginia

Bowdil Equipment in your mine...

DIL

REPLACEABLE POINT PICKS

—make it possible for miners to carry "extra picks in their pockets." Designed for ideal weight and balance, workers would still choose this pick—even without the special replaceable, heat treated points.



CHOKE-ARC TRANSFER SWITCHES

—enable you to cut power immediately in case of a break down in the electric system. Bowdil switches are dependable—operate instantaneously. A vital safety factor!

AUGERS & DRILL BITS

—are furnished in many sizes and styles. All are heat-treated, tough, and long-wearing. Correct auger design eliminates "grabbing." Fish-tail, four-point, two-point, etc., styles assure you of the right bit for every job.

Big Stone Gap, Virginia • Canton, Ohio • Birmingham, Alabama • Centerville, Iowa
Helper, Utah • Kansas City, Missouri • Topeka, Kansas • New Castle, England

THE BOWDIL COMPANY CANTON, OHIO

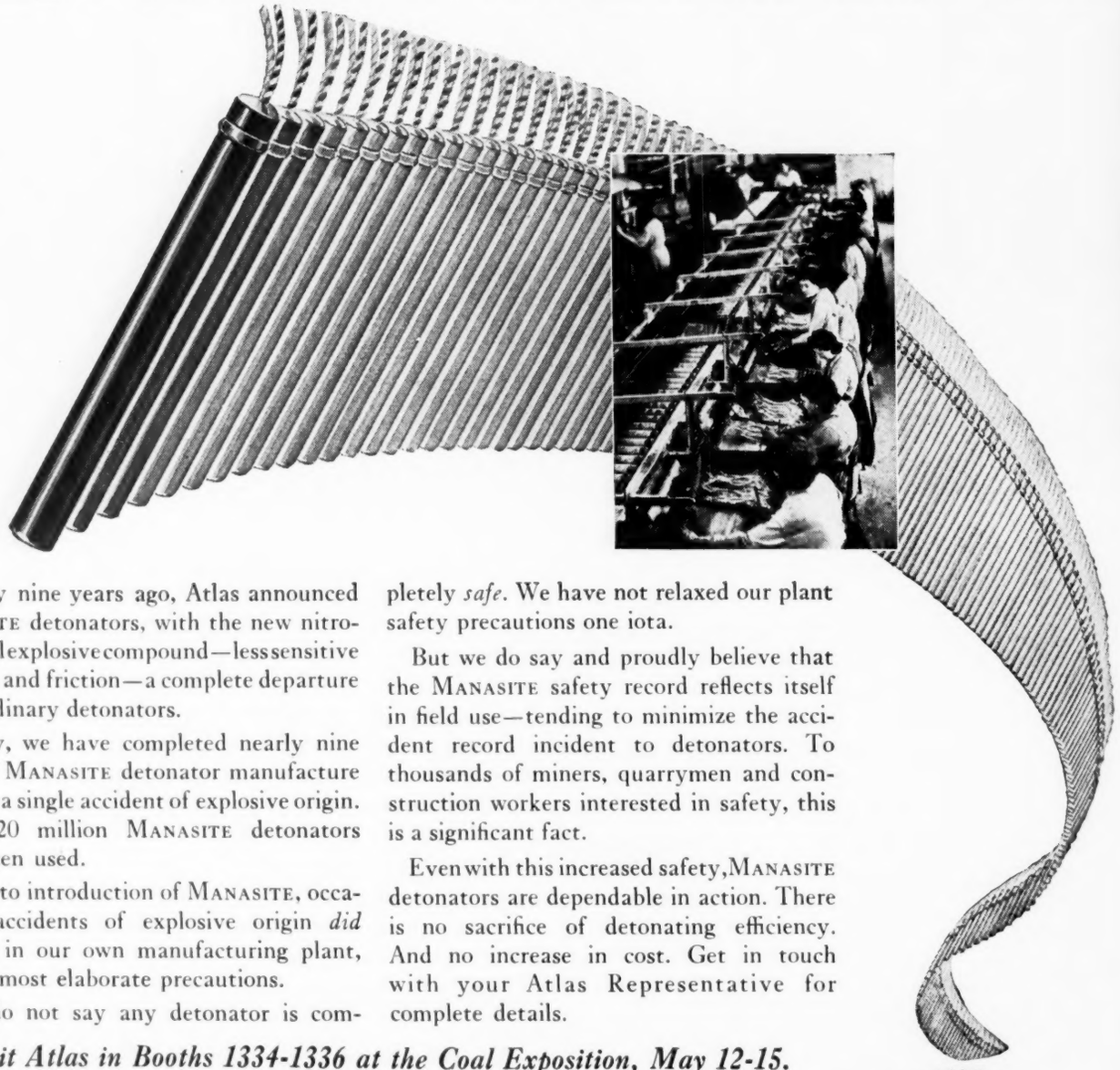
...brings profits out with the coal!

NO EXPLOSIVES ACCIDENTS

in the making of

520,000,000 MANASITE DETONATORS

An Eight-Year Record That Means Added Safety For You



Nearly nine years ago, Atlas announced MANASITE detonators, with the new nitromannitol explosive compound—less sensitive to shock and friction—a complete departure from ordinary detonators.

Today, we have completed nearly nine years of MANASITE detonator manufacture without a single accident of explosive origin. Over 520 million MANASITE detonators have been used.

Prior to introduction of MANASITE, occasional accidents of explosive origin *did* happen in our own manufacturing plant, despite most elaborate precautions.

We do not say any detonator is completely *safe*. We have not relaxed our plant safety precautions one iota.

But we do say and proudly believe that the MANASITE safety record reflects itself in field use—tending to minimize the accident record incident to detonators. To thousands of miners, quarrymen and construction workers interested in safety, this is a significant fact.

Even with this increased safety, MANASITE detonators are dependable in action. There is no sacrifice of detonating efficiency. And no increase in cost. Get in touch with your Atlas Representative for complete details.

Visit Atlas in Booths 1334-1336 at the Coal Exposition, May 12-15.

Manasite—Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address*—Atpowco

SEE JEFFREY'S

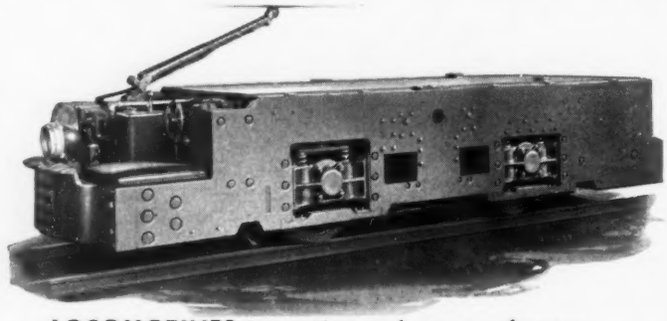
Modern Mine Equipment

AT THE MINING SHOW

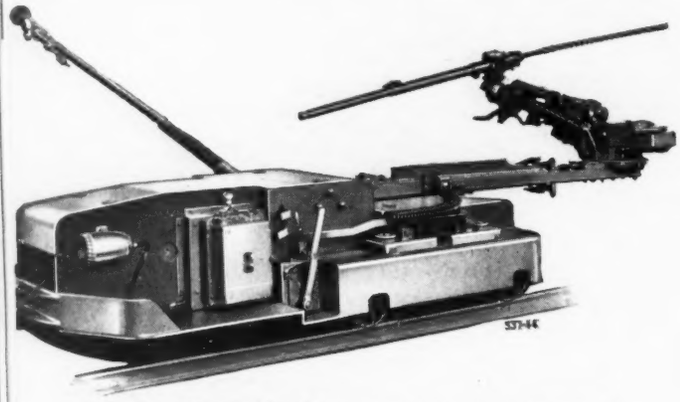
CLEVELAND ★ MAY 12-15, 1947

JEFFREY SERVES THE COAL MINES

29-U Universal Coal Cutter for cutting anywhere in the seam. Hydraulically operated and can be furnished track mounted, crawler mounted or with pneumatic tires. (Patented. Also licensed under E. C. Morgan Patent No. 1,953,325). Also Shortwall coal cutters in the famous 35 series—standard and low vein types including three for conveyor mining.

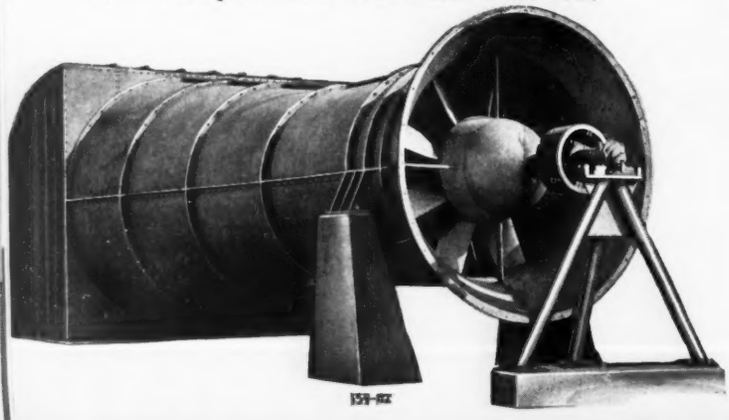


LOCOMOTIVES in trolley and storage battery types for main line and gathering service.



56-A Drilling Machine for fast drilling and properly placed shot holes. A wide range of adjustments, hydraulically controlled. Also Post and Hand Held Drills. (Patented and Patents Pending.)

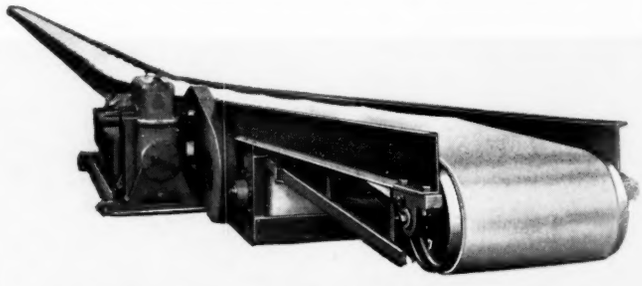
AERODYNE Fans and Blowers for the maximum in complete mine ventilation. (Patented.)



At the Show in Cleveland

It will pay you to "Stop—Look and Listen" at the Jeffrey Exhibit. You will see a wide variety of Jeffrey equipment . . . some of the 'Old Guard' units, some redesigned and some NEW . . . covering every phase of mining . . . drilling, cutting, loading, conveying, processing and transporting of coal as well as ventilating systems and a complete line of Renewal Parts.

Equipment designed and built to withstand the "rough going" underground . . . to produce continuously with a minimum of maintenance.

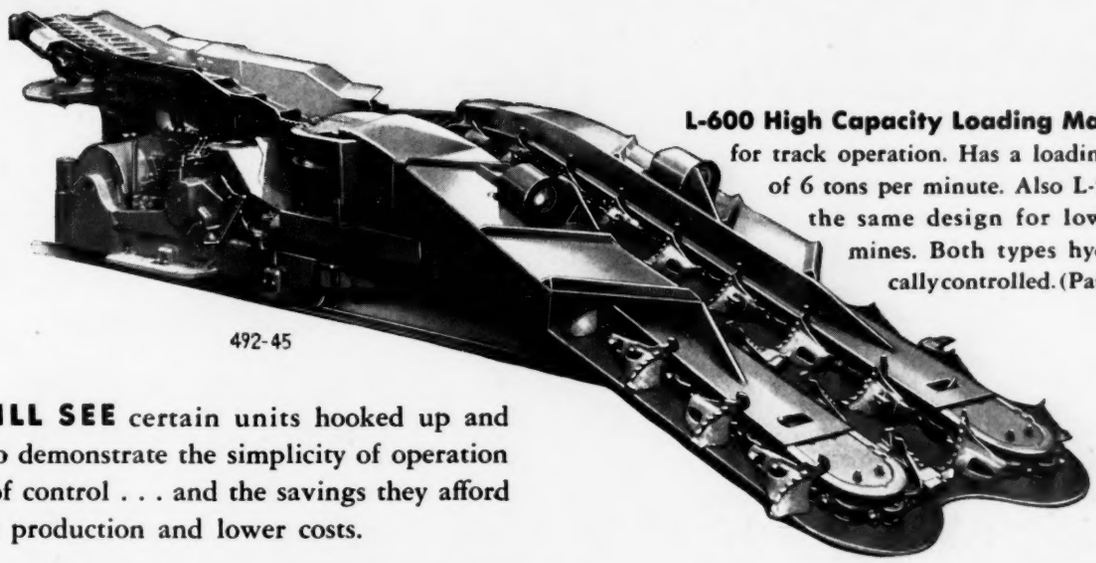


52-B Belt Type Entry Conveyor—can be extended up to 2500 feet. (Patented.)

MAKE THE JEFFREY

WITH MODERN MECHANICAL EQUIPMENT...

61-CLR Conveyor-Loader, a new and revolutionary low-type unit with pneumatic tires and hydraulic controls. Pivotally anchored at discharge point over conveyor, loader moves in an arc across room. Extensible gathering head permits loading from any angle. (Patent Pending.)

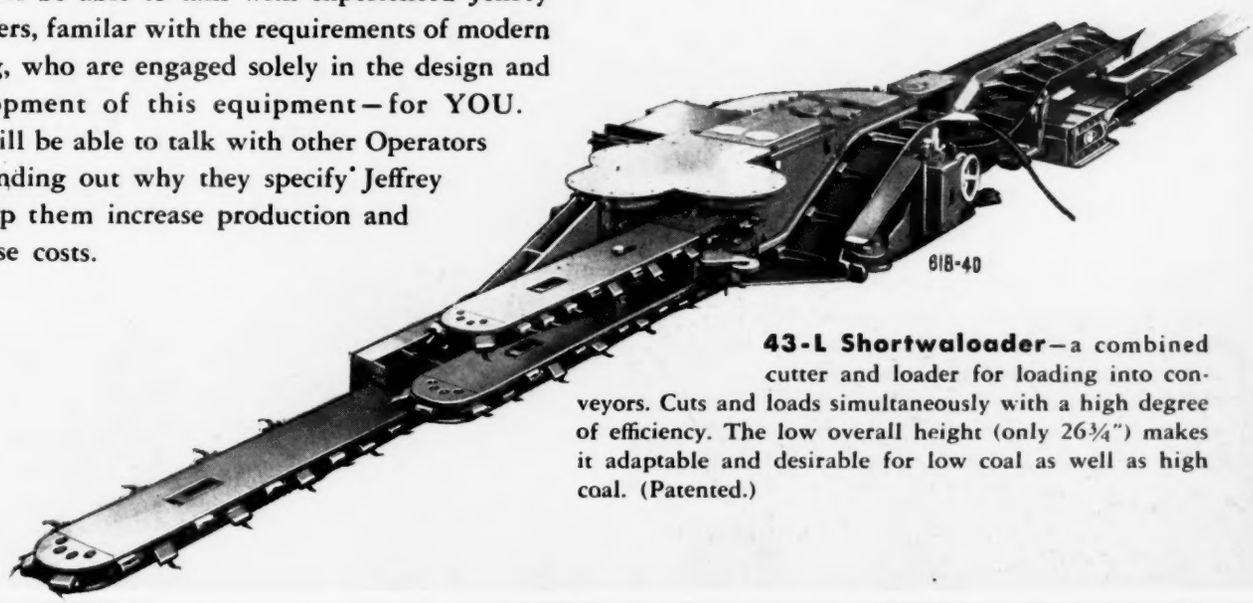


492-45

L-600 High Capacity Loading Machine for track operation. Has a loading rate of 6 tons per minute. Also L-500 of the same design for low vein mines. Both types hydraulically controlled. (Patented)

YOU WILL SEE certain units hooked up and running to demonstrate the simplicity of operation . . . ease of control . . . and the savings they afford in greater production and lower costs.

You will be able to talk with experienced Jeffrey engineers, familar with the requirements of modern mining, who are engaged solely in the design and development of this equipment—for YOU. You will be able to talk with other Operators . . . finding out why they specify Jeffrey to help them increase production and decrease costs.



818-40

43-L Shortwaloader—a combined cutter and loader for loading into conveyors. Cuts and loads simultaneously with a high degree of efficiency. The low overall height (only 26¾") makes it adaptable and desirable for low coal as well as high coal. (Patented.)

EXHIBIT A "MUST" ON YOUR CONVENTION PARADE

GENUINE Jeffrey RENEWAL PARTS

Jeffrey service to the coal mines is complete

★

JEFFREY EQUIPMENT FOR COAL MINES . . .

- BLOWERS
- CONVEYORS
- CRUSHERS
- CUTTERS
- DRILLS
- FANS
- JIGS
- LOADERS
- LOCOMOTIVES
- SCREENS

THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

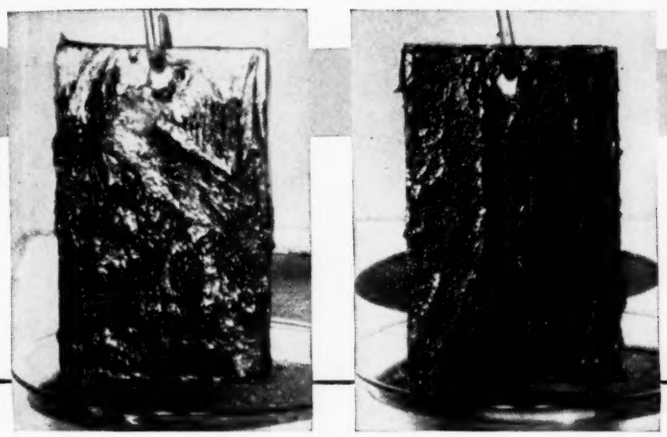
Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

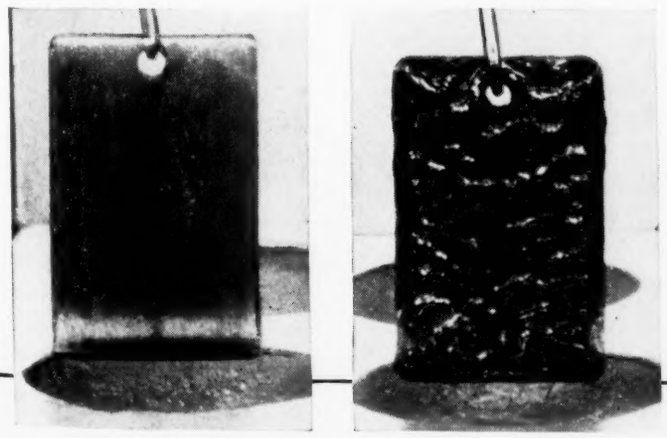
Where mine equipment needs water-resistant lubrication use....

CALUMET Viscous Lubricants



Test equipment for comparing water resistance of greases. Metal strips are coated with greases to be compared. Left strip—a conventional type soda soap grease. Right strip—a Calumet Viscous Lubricant.

The instrument dips the strips into beakers containing water at 80°F. at the rate of 30 times per minute for 20 hours.



The same test strips after the 20-hour test. The strip containing conventional type soda soap grease is practically bare. The strip holding Calumet Viscous Lubricant is still completely covered.

THE SIMPLE TEST described here shows how Calumet Viscous Lubricants reduce lubricant consumption and protect open gears and wire rope against wear, even though subjected to the direct washing action of water.

Calumet Viscous Lubricants give these advantages because they are compounded from selected soaps and oils of proper viscosities and contain a special additive which makes them adhere closely to metal. They do not require heating before application, and all but the heaviest grades can be sprayed. These application features offer direct savings in time and grease.

A Standard Oil Lubrication Engineer will help you select the grade you need for low cost lubrication on many mine applications.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

GOODMAN UNDERGROUND

Any Length

•

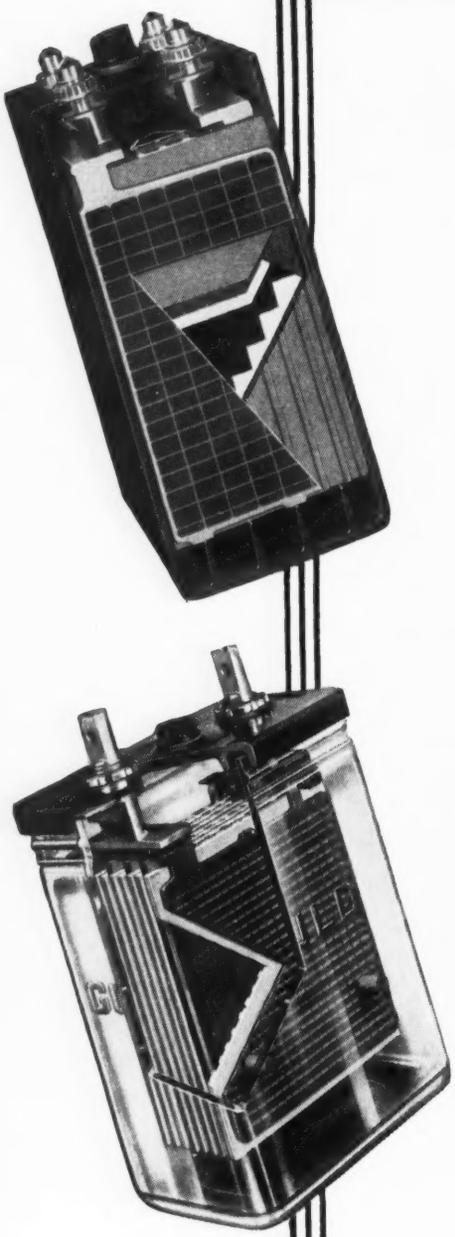
Any Capacity

BELT CONVEYORS

17107

Write for copy of
Bulletin C-611

GOODMAN MANUFACTURING COMPANY
CHICAGO 9, ILLINOIS



MEMO

Why don't you arrange to visit the Gould laboratory

we're never satisfied

Though our customers are

At the Gould plant in Depew, New York, there is the most modern laboratory in the world devoted solely to storage battery problems. Here basic research is being applied to every part and every use applicable to storage batteries.

Over the years this Gould research has introduced Glassklad construction in Kathanode, and ribbed, pure-lead positive plates in Plante. These designs set new standards of performance for storage batteries.

Gould leadership is based on sound scientific knowledge. Today and tomorrow it assures you better batteries. For the Gould catalog serving your industry write Dept. 114, Gould Storage Battery Corporation, Depew, New York.

GOULD

KATHANODE and Planté BATTERIES

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.
Service Centers: Atlanta • Boston • Buffalo • Chicago
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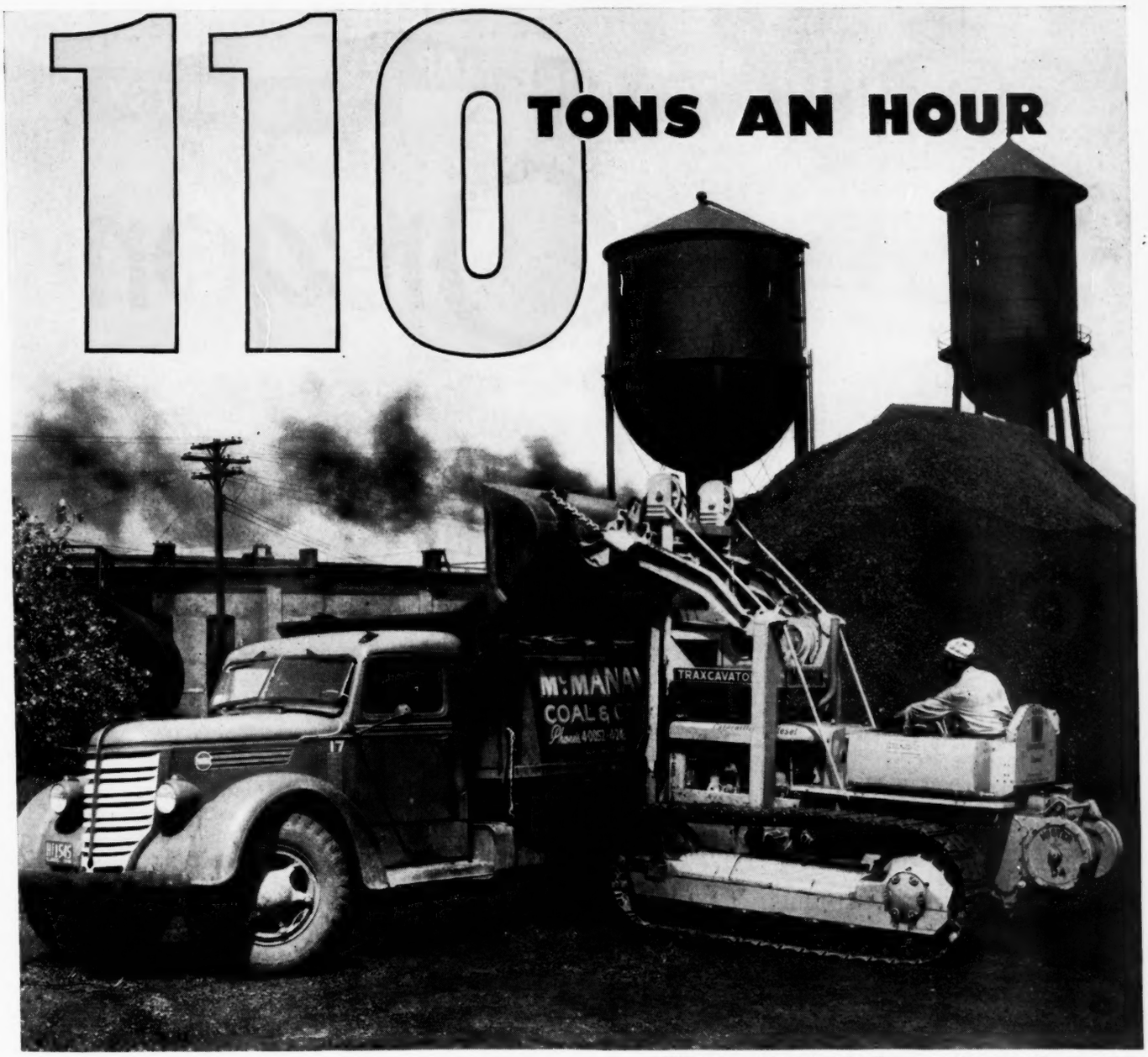
110 TONS AN HOUR



This "Caterpillar" Diesel D4 Tractor, equipped with Trackson Traxcavator and Hyster winch, loads 110 tons of coal an hour into trucks.

FAST, handy loading equipment can save a lot of time and money around a mine, coal-yard or industrial plant. And for this job a "Caterpillar" Diesel Tractor with Trackson Traxcavator is the last word in efficiency and versatility.

Tough, powerful and quick on its feet, the "Caterpillar" Diesel isn't tied down to one spot. It can take the load to the trucks, whether it's handling coal, cap-rock or overburden. Replacing the bucket with a bulldozer for other jobs is a simple matter, and the tractor's usefulness is multiplied.

Owners *expect* more from "Caterpillar" equipment, and they *get* it. Low operating cost and rugged dependability are built into every "Caterpillar" Diesel. Its economy and long life are backed by a dealer service known all over the world as the finest in the heavy-machinery field.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

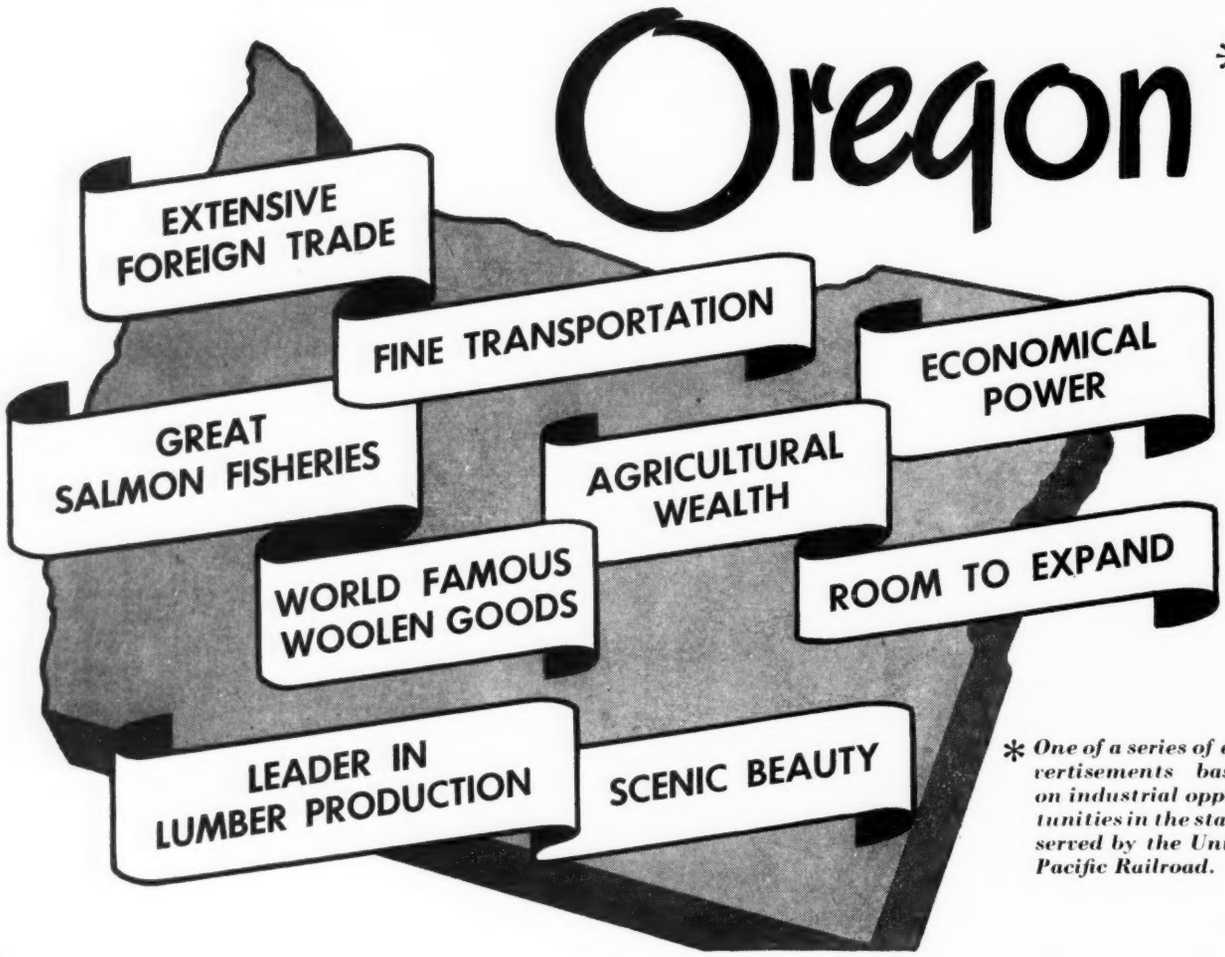
CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

UNION PACIFIC

TREASURE MAP OF INDUSTRY



* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

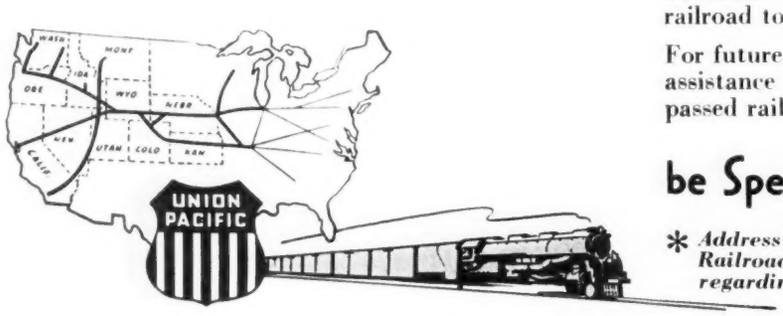
When the Beaver State presents its business card, it could justifiably read, "Enterprise, Unlimited." Industry re-discovered Oregon during the war. It found boundless opportunities capable of providing a livelihood for 10 times the state's present population.

Topographical, soil and climatic features make possible a variety of agricultural pursuits. The fabulous Willamette Valley—some three million acres—is a cornucopia of agricultural wealth. A tremendous quantity of lumber is available. The state has one-fourth of the country's standing saw timber. Salmon fisheries and woolen goods are world-famous. Portland's roomy harbor is a flourishing gateway of foreign commerce.

Huge Bonneville Dam assures ample and economical power. A new development program calls for four more dams. Oregon is noted for low electric rates.

Union Pacific provides Oregon with excellent freight and passenger transportation. Gigantic locomotives haul the state's products eastward over the "strategic middle route." And—just recently—Union Pacific inaugurated daily Streamliner service on the "City of Portland" between Portland and Chicago; the first railroad to provide such service.

For future industrial enterprise, remember Oregon. For assistance in selecting industrial sites and for unsurpassed rail transportation, just . . .



be Specific – say "Union Pacific"

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

CUMMINS
Dependable
DIESELS
SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

Efficient POWER

Low weight per horsepower . . . smooth operation over a wide range of engine speeds . . . simple design for easy servicing . . . these are reasons for the dependable, low cost performance that makes Cummins efficient power source

Dependable Diesels the most in the 84 to 275 hp range.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

NOW "VENTUBE" IS MADE WITH NEOPRENE

Tough, durable neoprene coating makes flexible ventilating duct even better than prewar type!

- LIGHTER IN WEIGHT
- MORE FLEXIBILITY
- EASIER TO COUPLE
- STANDS UP TO ACID
- RESISTS HEAT, AGING

Every miner knows that neoprene, the Du Pont synthetic rubber, is tough and durable, giving unusual service in conveyor belts, cable jacketing and other mine equipment. Now, you'll be glad to know "Ventube"* is made with neoprene. The "Ventube" fabric is thoroughly impregnated with a neoprene composition engineered to give long life and trouble-free service.

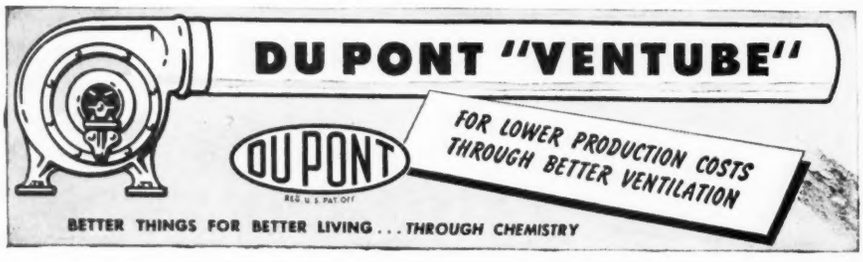
Many advantages of the new material: (1) Much more flexible for carrying air around curves or corners, for coupling and uncoupling; (2) Much lighter in weight, for lifting and carrying long lengths; (3) Neoprene is long-lasting, withstands corrosive acid or alkali waters, resists oxidation from heat and aging. Not only better than wartime types, but even better than prewar "Ventube."

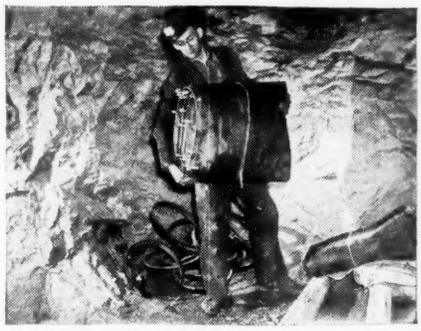
And remember that "Ventube," when attached to a motor-driven blower fan of adequate capacity, brings fresh air to men at work, clears the face quickly, reduces down-time after blast, speeds production. Easy to install, to move, to store. Low in both original and upkeep cost.

For further details, consult Du Pont Technical Service, Fabrics Div., E. I. du Pont de Nemours & Co. (Inc.), Fairfield, Conn.

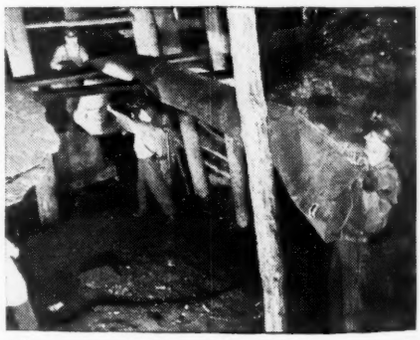
• • •

*"VENTUBE" *is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.*


DU PONT "VENTUBE"
DUPONT
REG. U. S. PAT. OFF.
FOR LOWER PRODUCTION COSTS THROUGH BETTER VENTILATION
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



"Ventube" made with neoprene is much lighter in weight, making it easy to store and handle.



The new-type "Ventube" is much more flexible for carrying around curves or corners, for quick coupling and uncoupling of sections.

Neoprene gives "Ventube" strong resistance to corrosive waters in mines, to oxidation from heat and aging.

ANACONDA ANNOUNCES

Securityflex Parallel mining cable in

NEW, SMALLER DIAMETER

Here it is, a new Securityflex parallel mining cable with ground wire that packs more cable on a reel, thanks to its new, smaller diameter—with the advantages of a tough, flame and abrasion-resistant Neoprene jacket . . . and unique, anti-short breaker strip construction.

Meeting all specifications of the Pennsylvania Flame Test, Securityflex is more than ever an investment in safe, continuous mine operation.

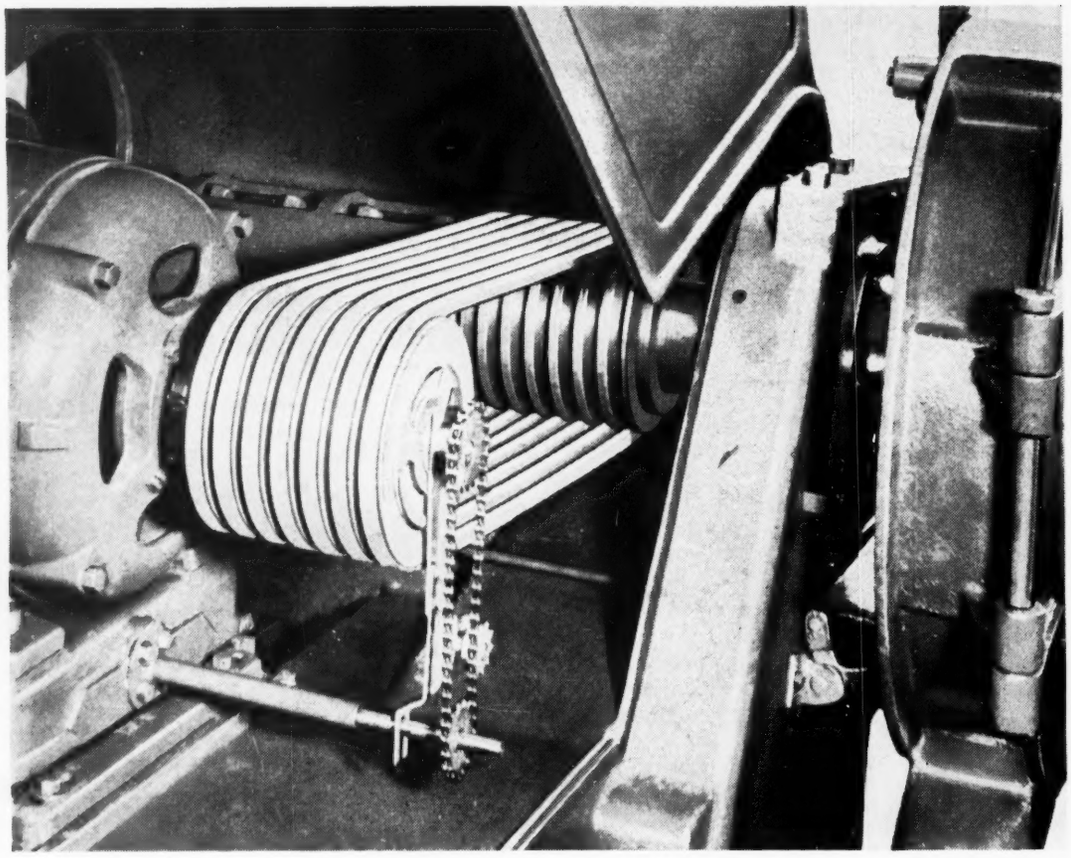
47446

New Ground Wire Cable Ideal for Shuttle Car Service

Here is a ground wire parallel mining cable that will stand up under severe abuse: Breaker Strip construction cuts short circuits. This cable is ideal for shuttle car service.

ANACONDA *Securityflex* **CABLE**

ANACONDA
from mine to consumer



Texrope *VARIABLE* Speed Drive ... the practical way to get *Accurate Speed Control*

- To regulate a machine tool to suit variations in job, material, or individual workman
- To control the volume of air from heating and ventilating fans
- To vary the speed of a pump, spinning frame, conveyor, rock crusher or grinding wheel
- *Wherever* the ability to change operating speeds at will can add to efficiency, output or economy —

Install Texrope Variable Speed Drives!

These flexible drives use economical constant speed motors. They provide infinite speed variations within their ranges — quickly, easily, accurately.

Vari-Pitch sheaves using A, B, C, D or E belts are available for stationary or motion control, with range up to 25% per sheave; *Vari-Pitch* sheaves using Q or R wide belts allow variations up to 100%; *Vari-Pitch* speed changers permit ranges up to 375%. There are types and sizes to suit all needs, from fractional to 300 hp!

Texrope offers the *most complete* line of variable speed drives made . . . engineered and built by Allis-Chalmers, originator of the multiple V-belt drive. See Sweet's Catalog, or call your nearby A-C office or dealer for Bulletin 20B6051G. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

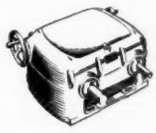
A 2200

TEXROPE .. Greatest Name in V-Belt Drives

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.



SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947
A CENTURY OF SERVICE to Industry THAT MADE America Great

Gulf Mining Machine Lubricant B

does the job of 2 or 3 other lubricants!

CAN HELP YOU CUT MAINTENANCE COSTS,

SIMPLIFY LUBRICANT STORAGE AND HANDLING

TAP THIS NEW SOURCE of greater lubricating efficiency—Gulf Mining Machine Lubricant B. This quality Gulf lubricant can help you cut maintenance costs, simplify lubricant storage and handling.

A heavy-bodied lubricant specially engineered by Gulf technologists for cutting and loading machines, Gulf Mining Machine Lubricant B lasts longer, has greater tenacity, insures less leakage from gear cases, and provides effective lubrication under water conditions.

Call in a Gulf Lubrication Engineer today and ask him to demonstrate the many advantages of this superior mining machine lubricant. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation · Gulf Refining Company

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Boston · New York · Philadelphia · Pittsburgh · Atlanta
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GULF INDUSTRIAL LUBRICATION

When used as

PORTABLE SWITCH

O-B Distribution

help you put controlled power where you want it....when you want it....and at lower cost

Acting as "portable switch panels" for face machines, O-B Distribution Boxes can help put an adequate supply of controlled power where you need it...when you need it...and at lowest cost per ton. As many as three machines can be operated from one trailing cable.

More than mere switch panels, however, O-B Distribution Boxes actually protect as well as control your vital power flow. Since each of the three branch circuits is individually fused, back-up protection is afforded machine cables and controllers.

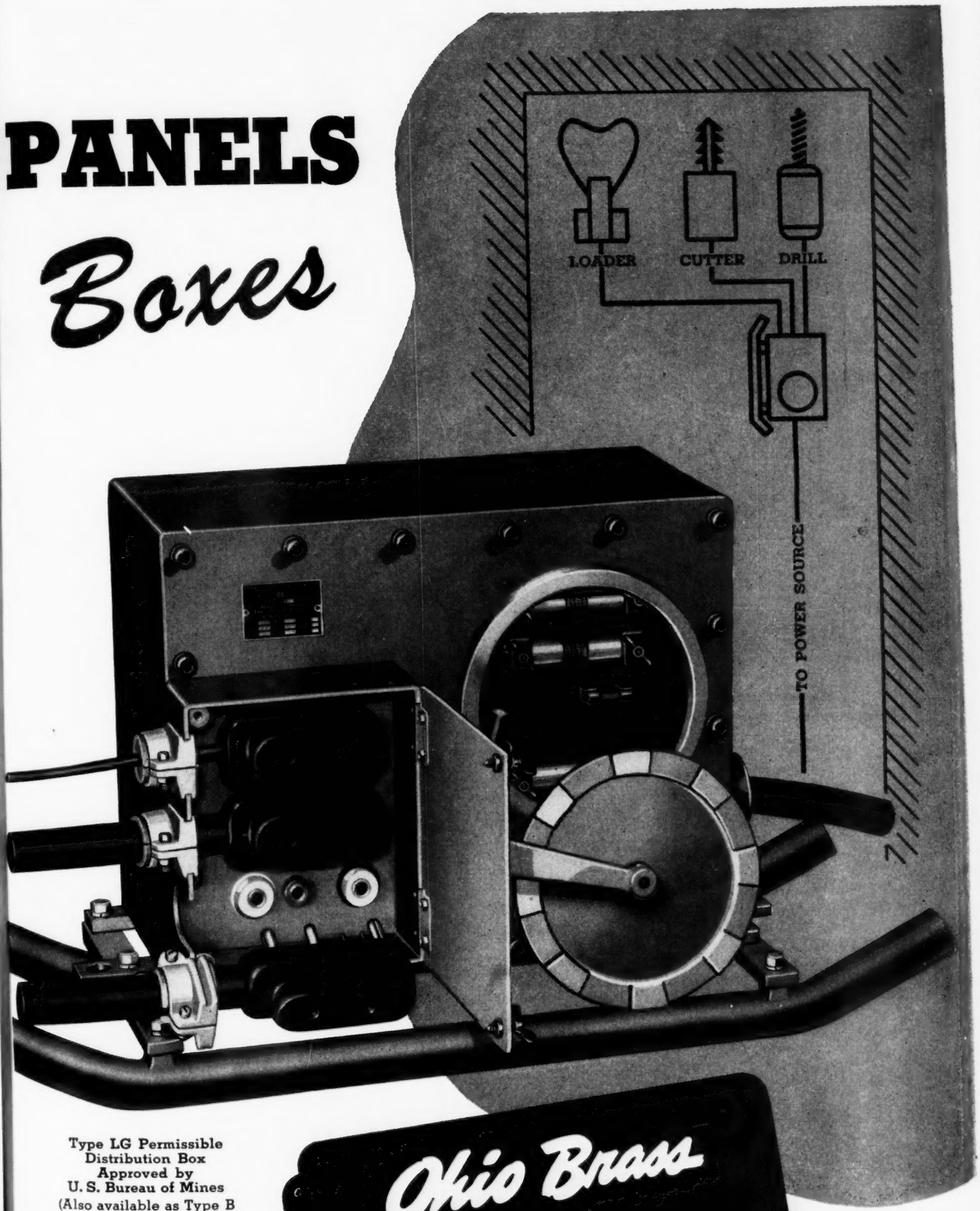
By interlocking the disconnect switch, to prevent branch circuits from being connected or fuses from being renewed with power "on", both workmen and equipment are safeguarded from hazard.

Only with an adequate flow of controlled power can machines operate at capacity and produce more tons per day... and at lowest cost. Help boost the efficiency of your face operations by handling power through O-B Distribution Boxes. A free descriptive booklet, No. 812-M is available on request.

For a complete power handling system . . . from substation to face

PANELS

Boxes



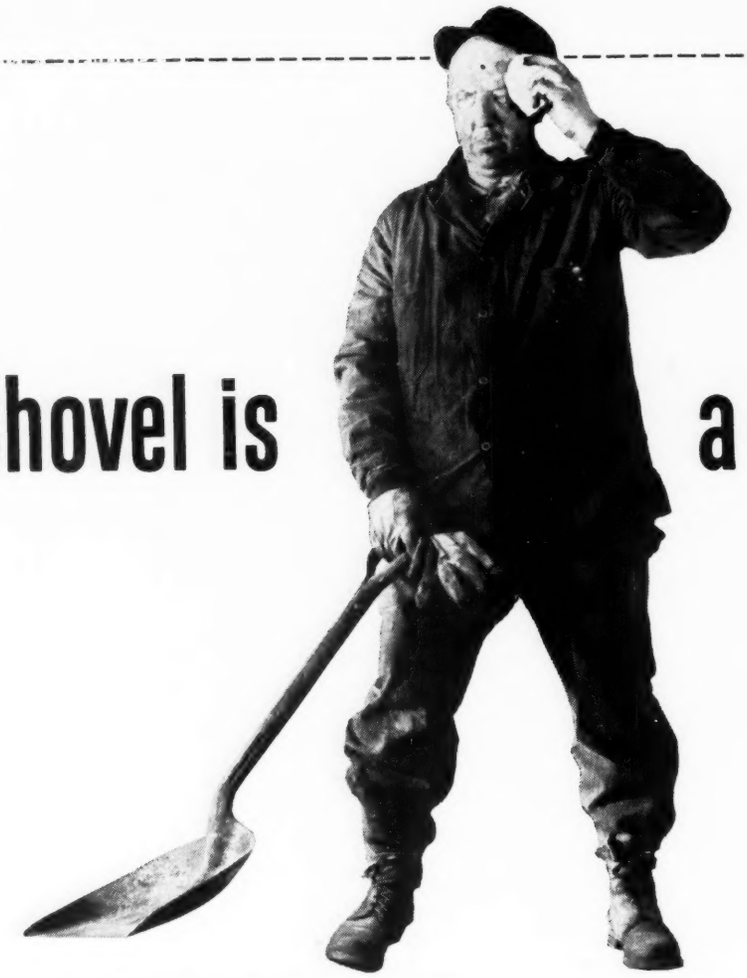
Type LG Permissible Distribution Box Approved by U. S. Bureau of Mines
(Also available as Type B with non-permissible case for non-gaseous mines)

Ohio Brass

2788-M

. . specify O-B

A Shovel is a Luxury!



IT MAY NOT SEEM TO BE—But every time you use any manual tool to unload hopper cars . . . it costs you money! It costs you time! It costs you production! Yes . . . a shovel or any similar manual tool is a luxury!

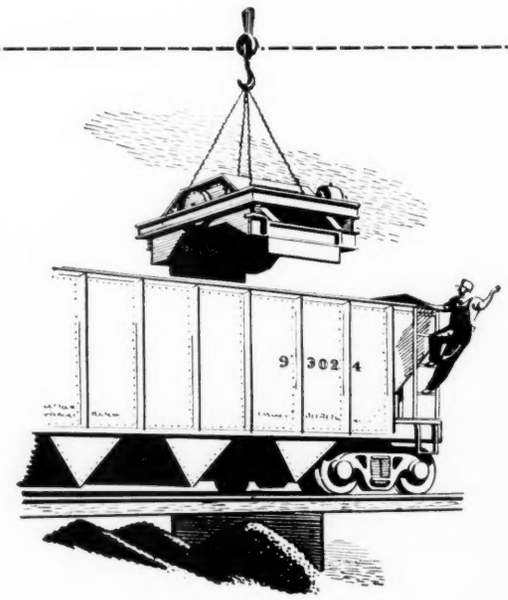
BUT WHEN ROBINS CAR SHAKEOUTS ARE PUT TO WORK—

They do your job cheaper. For example, two men can do the work of six or more men. And no expensive installations are needed.

They do your job faster. Packed hopper cars can be unloaded in minutes—not hours. This means cars and locomotives are released sooner.

They do your job better. Robins car shakeouts empty cars "broom clean." There's no clean-up shovel work needed.

So solve your hopper car unloading problems . . . cut your costs with a Robins Car Shakeout. Write today for complete information.



ROBINS
CAR SHAKEOUTS

"Job-Engineered" to solve your problem
CHEAPER . . . FASTER . . . BETTER

You are invited . . . to visit the Robins Conveyors Exhibit at the American Mining Congress Annual Coal Convention — Spaces 1533, 1539, and 1545 — Cleveland, May 12 through 15

ROBINS CONVEYORS DIVISION, HEWITT-ROBINS INCORPORATED, PASSAIC, NEW JERSEY

a new, improved,

PORTABLE CABLE

jacketed with GEOPRENE*

GE Announces

Shielded, three-conductor, Type SH-D, 5,000 volts, recommended for electric shovels and other portable electric machinery.

BETTER THAN "TELLURIUM"

- **TOUGHER IN THE TEAR TEST**
- **HIGHER IN SUNLIGHT RESISTANCE**
- **FLAME RESISTANT!**

Most important factor in portable-cable life is the use-and-abuse resistance of the cable jacket. Today, G.E. is able to offer a portable cable guarded by a new, super-tough Geoprene jacket. This new jacket is tougher and longer aging then Tellurium, our famous prewar rubber jacket, and meets or exceeds in every particular exacting ASTM requirements.

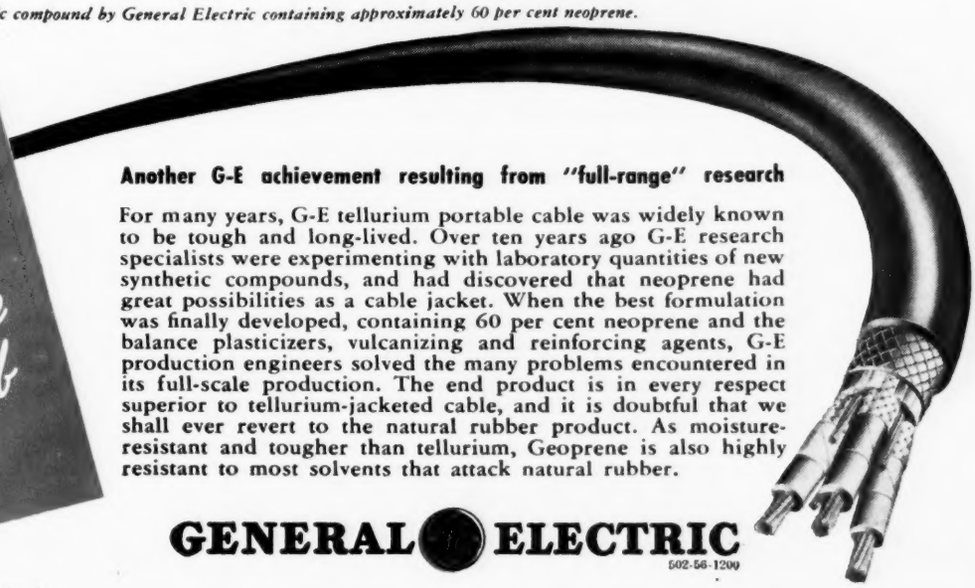
In tear resistance the jacket is 175 per cent better than called for by ASTM requirements, and 150 per cent better than Tellurium. In the oxidation test (which measures aging properties) typical values exceed ASTM standards by 105 per cent. Geoprene carries Approval No. P-108 by the Pennsylvania Dept. of Mines for flame resistance.

G-E portable cable stands up under rough-and-tough operating conditions. Strands and jackets are extra flexible to withstand constant flexing. Geoprene retains its mechanical strength longer than rubber, even when subjected to moisture, continued movement, and especially to intense sunlight.

There is a right type and size of G-E portable cable for every mobile power-transmission job. Each is designed to help you get long life and top-notch performance from a wide range of electrical equipment. Your local G-E representative will gladly supply recommendations for your particular requirements. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

*GEOPRENE: *A special synthetic compound by General Electric containing approximately 60 per cent neoprene.*

GE INSULATED CABLE *Always the right cable for your job*



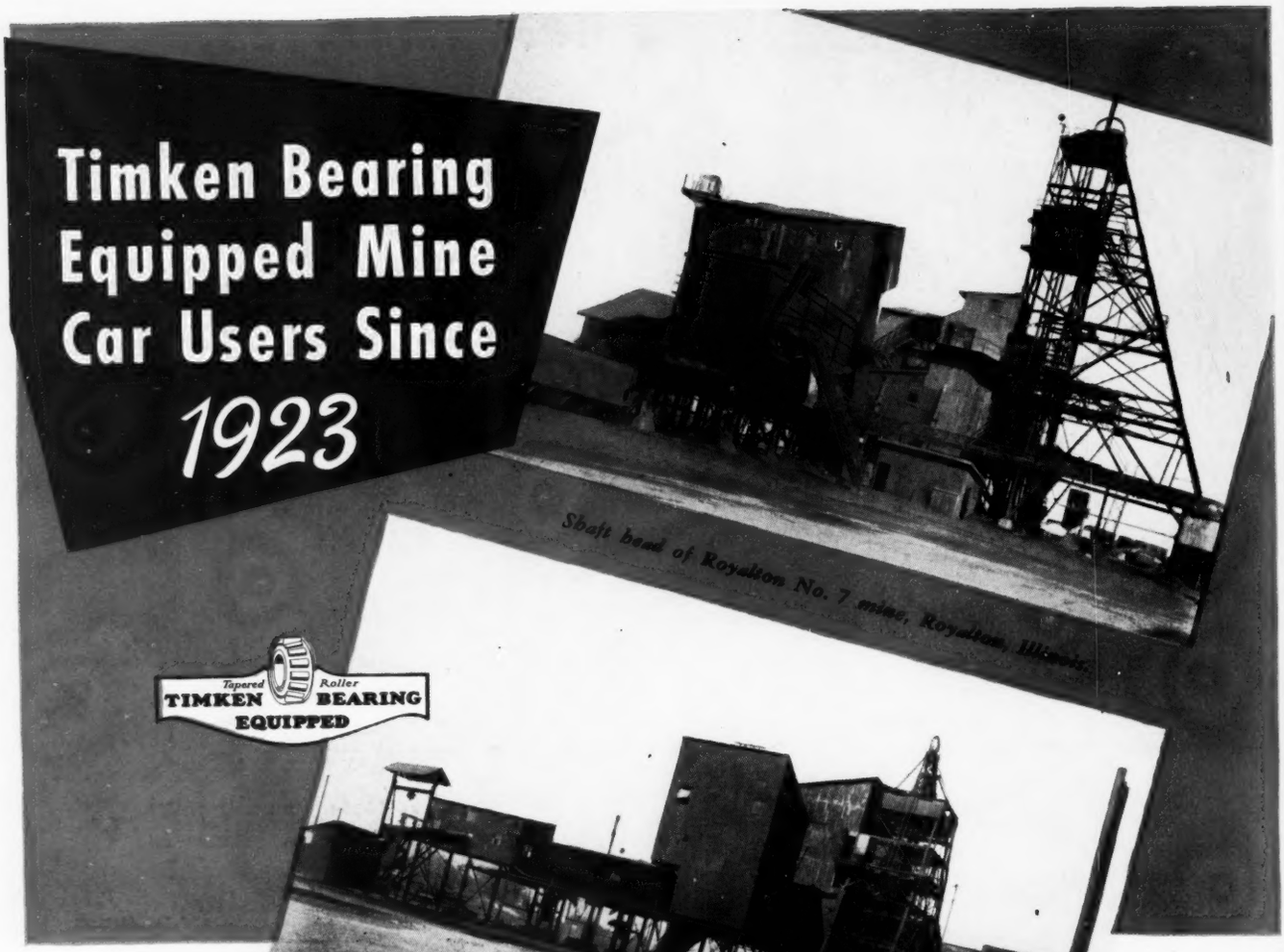
Another G-E achievement resulting from "full-range" research

For many years, G-E tellurium portable cable was widely known to be tough and long-lived. Over ten years ago G-E research specialists were experimenting with laboratory quantities of new synthetic compounds, and had discovered that neoprene had great possibilities as a cable jacket. When the best formulation was finally developed, containing 60 per cent neoprene and the balance plasticizers, vulcanizing and reinforcing agents, G-E production engineers solved the many problems encountered in its full-scale production. The end product is in every respect superior to tellurium-jacketed cable, and it is doubtful that we shall ever revert to the natural rubber product. As moisture-resistant and tougher than tellurium, Geoprene is also highly resistant to most solvents that attack natural rubber.

GENERAL ELECTRIC

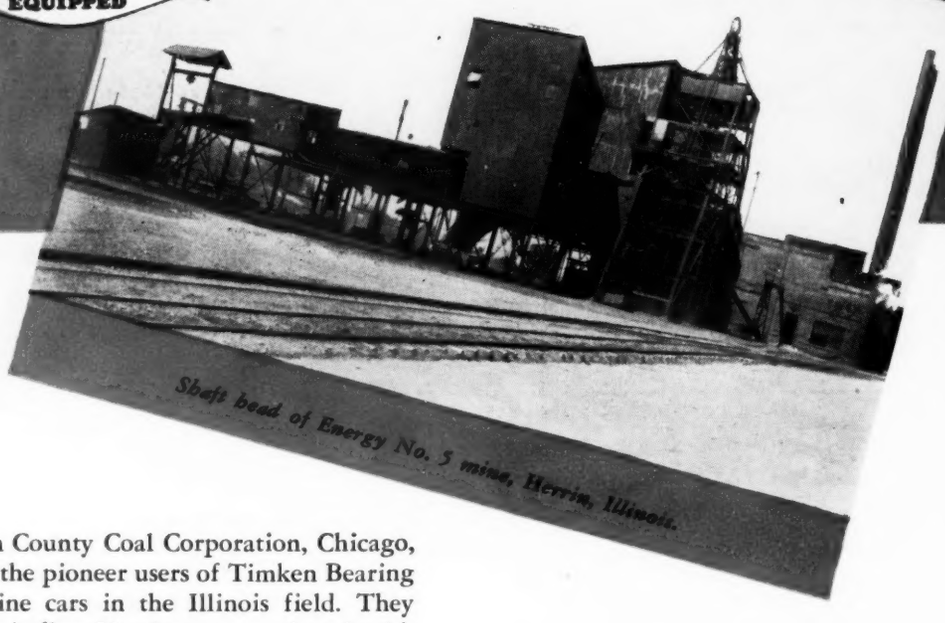
502-56-1200

Timken Bearing Equipped Mine Car Users Since 1923



Shaft head of Royalton No. 7 mine, Royalton, Illinois.

Tapered Roller TIMKEN BEARING EQUIPPED



Shaft head of Energy No. 5 mine, Herrin, Illinois.

The Franklin County Coal Corporation, Chicago, Ill., is one of the pioneer users of Timken Bearing Equipped mine cars in the Illinois field. They purchased their first 50 mine cars equipped with Timken Tapered Roller Bearings in 1923 for their Royalton No. 7 mine, Royalton, Ill. Since then they have standardized on Timken Bearing cars and the Royalton mine now is practically 100% Timken.

About 6 years ago the Franklin Coal Corporation started a modernization program at their Energy No. 5 mine, Herrin, Ill.; practically all of the cars at that mine now are on Timken Bearings.

This progressive coal mine operator has expressed great satisfaction with the performance and economy of Timken Bearing Equipped mine cars—as have upwards of one thousand others. They have proved it pays to operate them.

Specify "Timken Bearing Equipped" when buying new mine cars. Look for the trade-mark "TIMKEN" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◐ AND THRUST ⊣◐⊢ LOADS OR ANY COMBINATION

THIS DRAGLINE COST $36,000

. . . but it can't work!

● This is a dragline and it cost approximately $36,000—but it can't do a lick of work because the wire rope is missing. How much does the rope cost? Ordinary wire rope—about $217. The best wire rope—Preformed Improved Plow Steel—about $260!

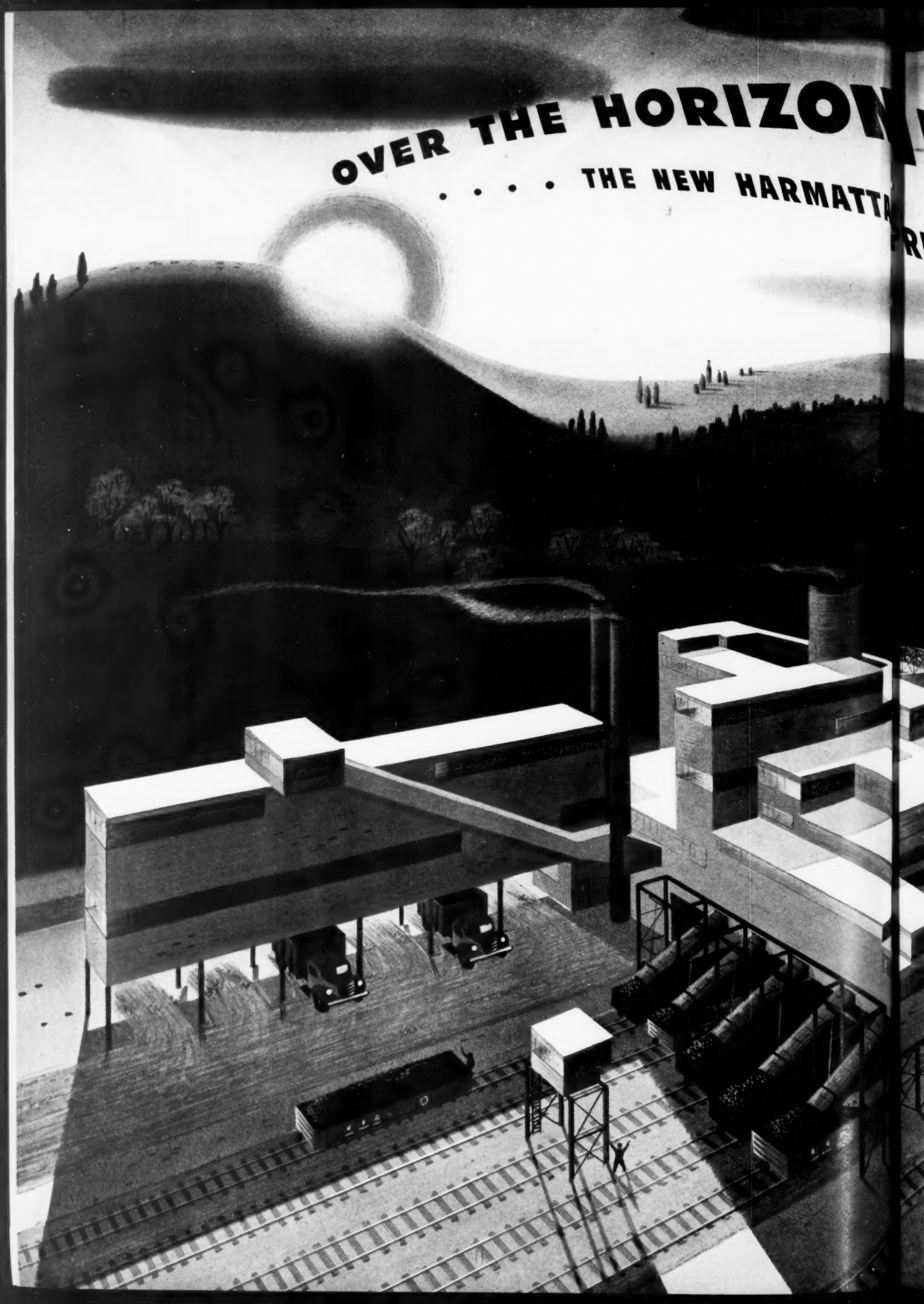
Specify Preformed Improved Plow Steel when you order for replacement. And when you buy such a machine, tell the manufacturer to equip it with Preformed Improved Plow Steel.

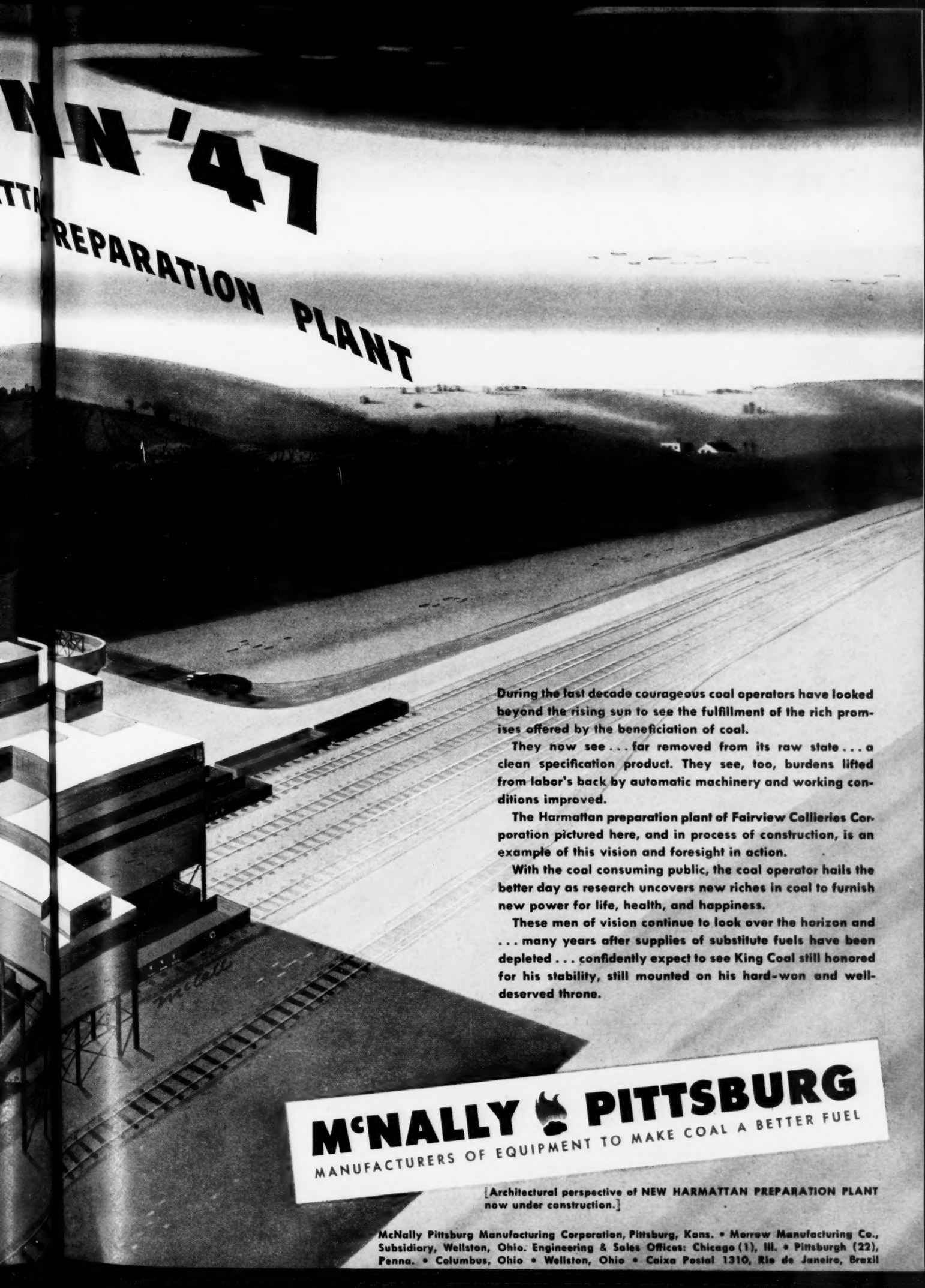
It lasts longer, is easier and safer to handle; it's more flexible and spools better.

WRITE FOR FREE COPY of helpful book about Preformed. Address: Preformed Wire Rope Information Bureau, 520 North Michigan Ave., Chicago 11.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

WIRE ROPE HANDLES EASIER - LASTS LONGER


OVER THE HORIZON
. . . . THE NEW HARMATTA



During the last decade courageous coal operators have looked beyond the rising sun to see the fulfillment of the rich promises offered by the beneficiation of coal.

They now see . . . far removed from its raw state . . . a clean specification product. They see, too, burdens lifted from labor's back by automatic machinery and working conditions improved.

The Harmattan preparation plant of Fairview Collieries Corporation pictured here, and in process of construction, is an example of this vision and foresight in action.

With the coal consuming public, the coal operator hails the better day as research uncovers new riches in coal to furnish new power for life, health, and happiness.

These men of vision continue to look over the horizon and . . . many years after supplies of substitute fuels have been depleted . . . confidently expect to see King Coal still honored for his stability, still mounted on his hard-won and well-deserved throne.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

[Architectural perspective of NEW HARMATTAN PREPARATION PLANT now under construction.]

McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans. • Morrow Manufacturing Co., Subsidiary, Wellston, Ohio. Engineering & Sales Offices: Chicago (1), Ill. • Pittsburgh (22), Penna. • Columbus, Ohio • Wellston, Ohio • Caixa Postal 1310, Rio de Janeiro, Brazil

40th
ANNIVERSARY OF
INTERNATIONAL TRUCKS
1907-1947—Forty years of International Truck Service to Industry, Commerce and Agriculture.

New INTERNATIONAL Trucks

For 16 years more heavy-duty International Trucks have served American commerce and industry than any other make.

Now come *new* KB Models—light-duty, medium-duty and heavy duty—with gross vehicle weight ratings from 4,400 to 35,100 pounds. Note the designation—KB.

That means many features and improvements... new goals in engineering, research, and design... new styling with trim, flowing lines accented by gleaming chrome.

And that means rugged International stamina, long, trouble-free life, and ease and economy of operation in greater abundance than ever before.

Yes, KB Internationals are the finest trucks in 40 years of International Truck history. In the complete line is the right truck for every job. And back of every truck is service as great as the trucks themselves, supplied by the nation's largest company-owned truck service organization—International Branches—and thousands of International Dealers.

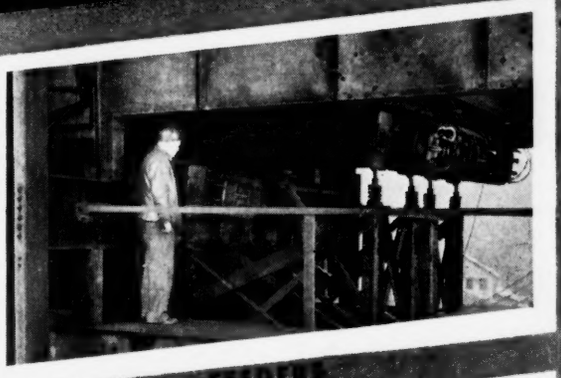
Tune in James Melton on "Harvest of Stars" every Sunday! NBC Network. See newspaper for time and station.

Motor Truck Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

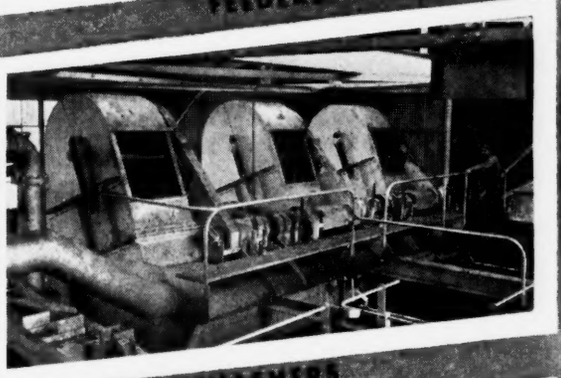
INTERNATIONAL TRUCKS

. . . and above ground
TIPPLES and
EQUIPMENT

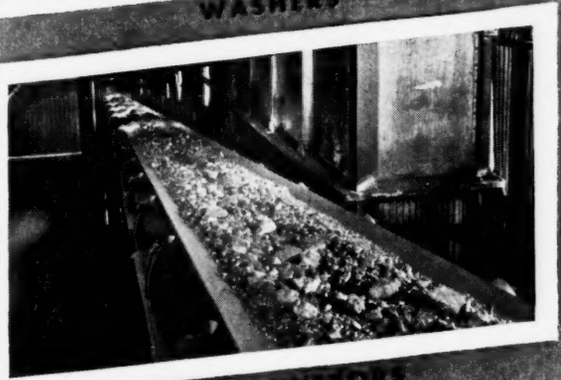
MIXING


FEEDERS

CRUSHERS


WASHERS

SCREENS


BELT CONVEYORS

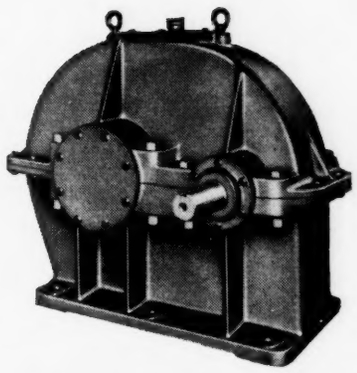
LOADING BOOMS

JEFFREY

ESTABLISHED 1877

Complete Line of Material Handling, Processing and Mining Equipment

if you're one of the Four...
YOU'LL WANT THE 6 BENEFITS
OF THIS PACKAGED DRIVE
WESTINGHOUSE
MEMBER OF
AGMA



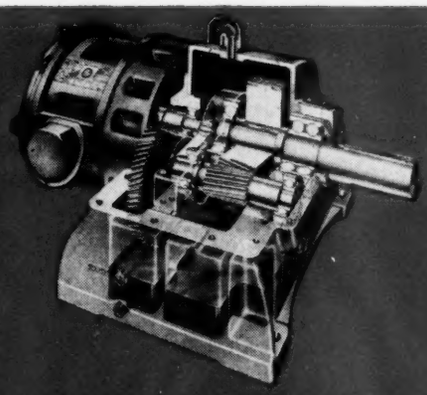
This Type SH speed reducer is a single-reduction unit which is furnished in thirteen standard ratios in each of twelve sizes. The Type DH speed reducer, which is a double-reduction unit, is offered in fifteen standard ratios in each of twelve sizes.

If your machines are among the four out of five that run slower than their prime movers, here are six ways you can profit by using Westinghouse speed reducers:

1. Improved power efficiency (one plant raised it from 80.9% to 85.4%)
2. Fewer inspections . . . only semiannual lubrication needed.
3. Maintain positive alignment of drive and driven machine.
4. Long service life through single helical gearing, specially heat-treated by exclusive Westinghouse BPT process.
5. Minimum power loss with antifriction bearings.
6. Precision operation from hot-cut gears.

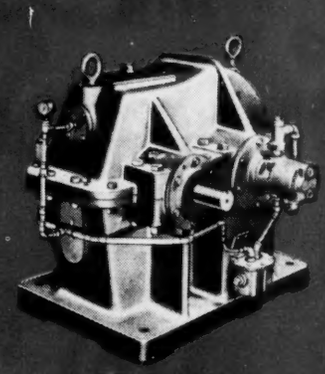
Add to these benefits the advantage of unit responsibility with both motors and gear supplied by one manufacturer. You have your choice of twenty-four sizes of Westinghouse speed reducers—Types SH and DH—for drives up to 1,000 hp with speed reduction ratios of 2.82 to 70.5.

Write, wire or telephone to your nearest Westinghouse office today, for full information on the application of speed reducers to your own drives. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-07252



FOR DRIVES FROM 1 TO 75 HP CHOOSE GEARMOTORS

Within the standard listed range of 1 to 75 hp ratings, you get the best in speed reduction with Westinghouse gearmotors. Three types—A, C and E—are available and provide output speeds from 1,450 to 16.5 rpm. All unit types can be used with either single-phase, polyphase or d-c motors.



USE THESE HIGH-SPEED UNITS UP TO 2,000 HP AND 9,000 RPM

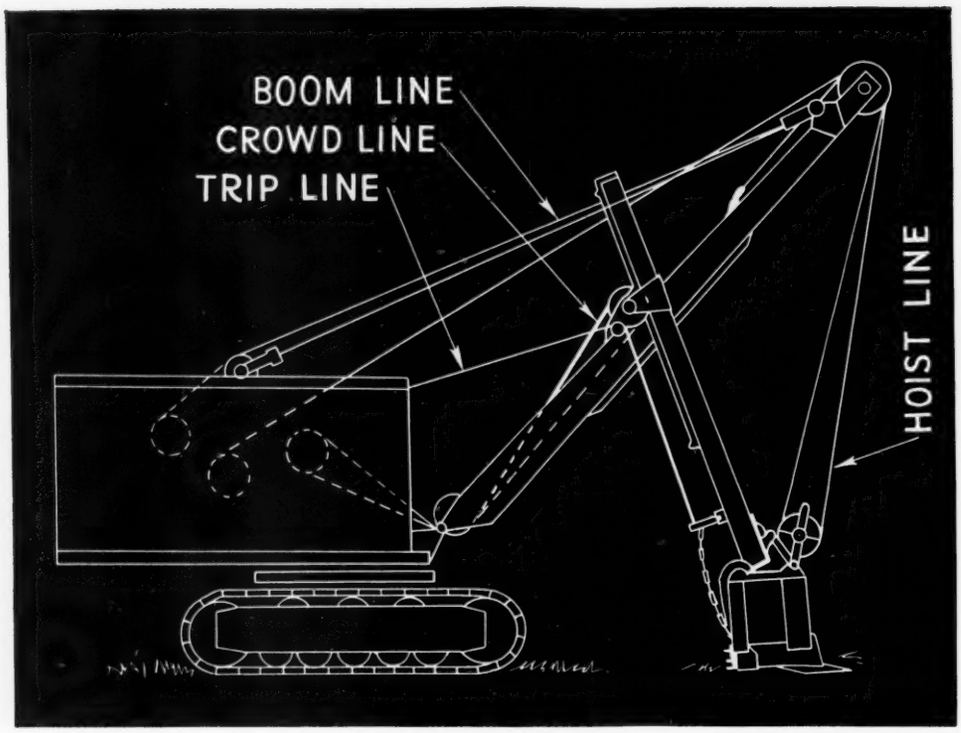
These Westinghouse Type SU units are specially designed for high-speed duty in speed increasing services for pumps, compressors and similar applications. Units are available in 30 sizes—with gear ratios from 1.25 to 3.25 up to 2 to 12.

You'll find all the facts on industrial geared drives in this new, picture-packed book. Ask for your copy of B-3730 today, on your business letterhead, please.

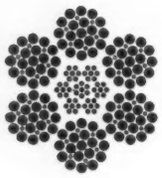
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

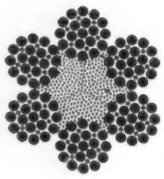
4 out of 5 drives need speed reduction



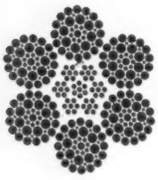
Things to know in buying Ropes for Power Shovels



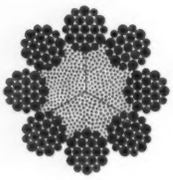
TYPE W
independent
wire rope core



TYPE W
fibre core



6 x 37 TYPE Q
independent
wire rope core



8 x 19 WARRINGTON
fibre core

Here are several important points to consider when you plan to rerig power shovels:

HOIST LINES must stand up under severe bending. They encounter some wear and are subjected to unusually heavy shock loads. For this service one of the most commonly-used ropes in diameters up to 1⅜ in. is a Bethlehem Purple Strand 6 x 19 Type W, with lang lay and independent wire rope core. The Form-Set (preformed) construction is widely specified.

BOOM LINES are more or less stationary. With little movement, there is little wear. A Bethlehem Purple Strand 6 x 19 Type W rope, with regular lay and independent wire rope or fiber core, is a popular choice. Lang lay is also commonly used.

CROWD LINES encounter bending, crushing, and wear. Purple Strand Form-Set 6 x 19 Type W with lang lay and independent wire rope core gives excellent service. Some shovels require 6 x 37 flexibility.

TRIP or DUMP LINES experience little wear. 8 x 19 plow steel, fiber core, regular lay, is usually satisfactory on small shovels; 6 x 19 Type W is preferable on large ones.

In cases of doubt, we strongly recommend that you consult a Bethlehem field engineer. It's part of his job to help you select the *right* wire rope for your equipment.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

When you think WIRE ROPE . . . think BETHLEHEM

AMERICAN
CYANAMID COMPANY
EXPLOSIVES

"TAILORING" THE BLAST TO YOUR SPECIFIC NEEDS!

Testing ammonium nitrate for sizing and density to control rate of detonation is just one of many painstaking laboratory procedures behind each grade of AMERICAN Explosives. For, whatever your blasting requirements, there is a grade of AMERICAN Explosives "tailored" specifically to meet them. And intensive laboratory research, close chemical control, and unremitting care throughout the manufacturing process guarantee that the grade you select will do its assigned job efficiently and economically.

• *Capable field engineers are available at your call.*

★ HIGH EXPLOSIVES

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NEW SPEED...POWER.

Extra long chuck with extra large bearing surface for good alignment and long life.

To prevent the entrance of dirt or water air is fed to the chuck automatically.

A double tube is used. Air flow is automatically maintained in the outer tube. The inner tube is for water.

New, more positive control of the powerful feed leg.

Side rod nuts located at feed leg collar position. The feed cylinder can be removed without disturbing the assembly of the front head, cylinder and back head.

Holding handle is located above the center of gravity for easier control of the stoper.

Throttle handle is raised to start the stoper, lowered to stop it. Falling rock cannot start the 600.

Powerful rotation. Oversize rifle bar and large bronze rifle nut assures added tool life and very powerful rotation.

PLUS these Extra Job-Tested Features:

A built in oil reservoir and a force feed system in which the correct amount of lubricant is metered out by a plunger assures the most efficient type of lubrication to all parts, including the chuck.

The famous Thor air valve has large bearing areas, extreme light weight, short travel. Results: faster action and longer life.

. . . HANDLING EASE

THE NEW

Thor

STOPER ROCK DRILL MODEL 600

Coming . . . More New Models . . . New Sizes

The model 600 is the fastest, hardest hitting, smoothest handling heavy duty stoper ever built by Thor.

Every feature has been designed to perform to drill runners' specifications . . . thoroughly proved underground and universally approved by the men who have seen the 600 in action.

A trial run will convince you. See your nearest Thor representative for a demonstration.

INDEPENDENT PNEUMATIC TOOL COMPANY

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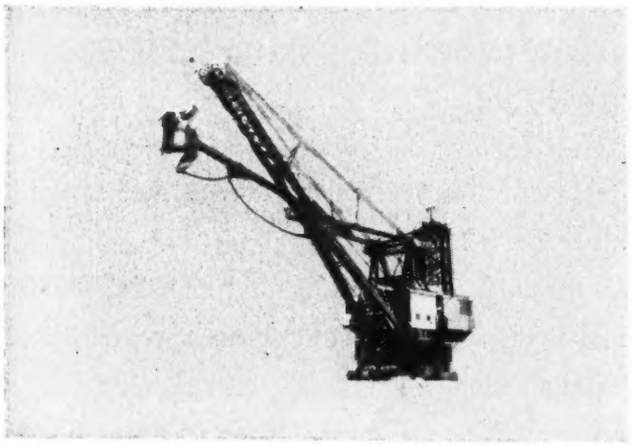
Thor PORTABLE POWER TOOLS

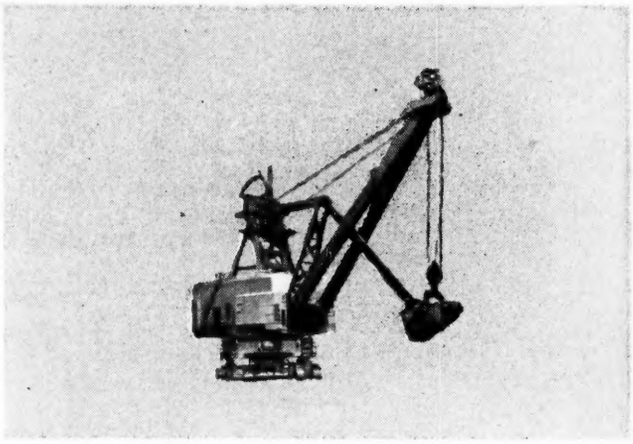
PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

Saves precious

between here...

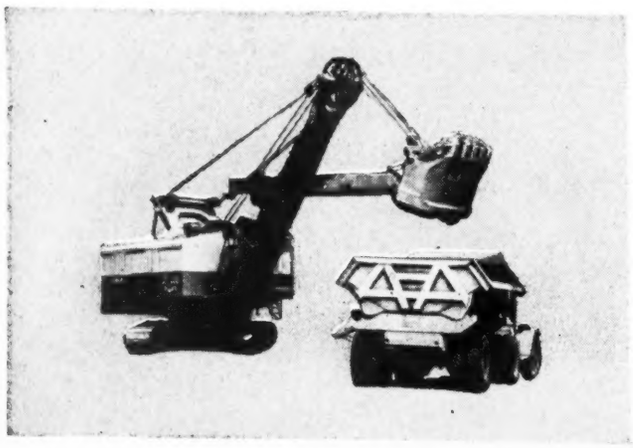


Type 1050B stripping shovel, 33 cubic yard capacity, amplidyne-equipped

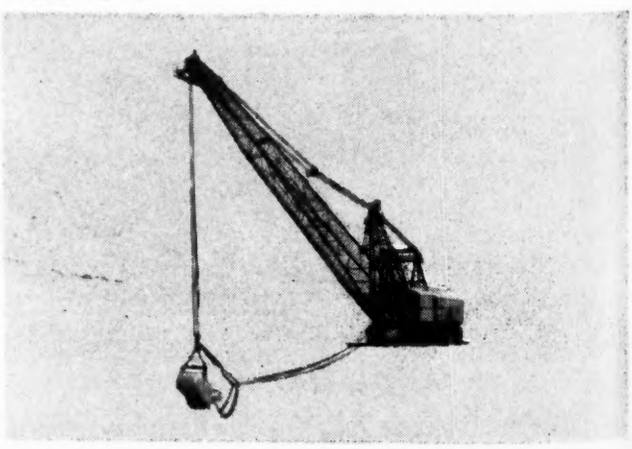


Type 5561E stripping shovel, 35 cubic yard capacity, amplidyne-equipped

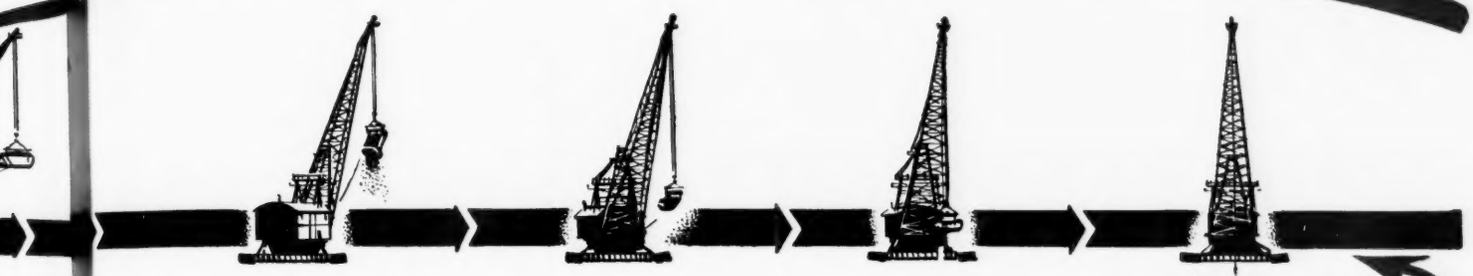
Type 151M loading shovel, 6 cubic yard capacity, amplidyne-equipped



Type 1150B walking dragline for anthracite stripping, 25 cubic yard capacity, amplidyne-equipped



Seconds...



...and here

G-E Amplidyne control for electric excavators gives you faster cycles — greater tonnage per machine — lower stripping costs!

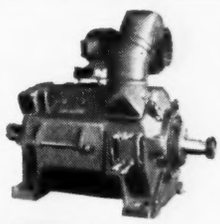
It happens whenever an electrified shovel or dragline comes on to a stripping. Yardage records are broken—overall costs go down. A large part of the credit must go to the General Electric Amplidyne—heart of the control system that has helped in no small way to make coal stripping a profitable operation. The reasons?

FIRST—Amplidyne control gives your operator a swifter, surer touch. Motors respond almost instantly to his signals. Fast acceleration and deceleration cuts precious seconds off hoist, swing, and crowd (or drag) motions. Operating cycles are shorter, daily tonnage handled is higher.

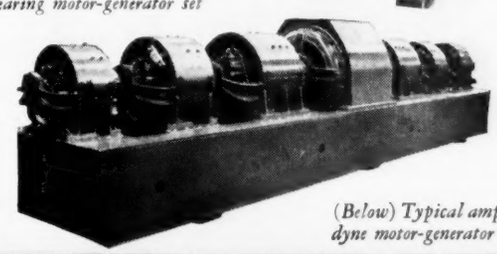
SECOND—Equipment downtime is smaller because stress on pinions and front-end strain is kept to a minimum. The Amplidyne acts as a regulator and even at high speeds, prevents the excessive current and torque peaks which damage electrical and mechanical machinery.

THIRD—Amplidyne is basically simple. Fewer control devices are used in an Amplidyne control system. They need less maintenance—require less space—stay on the job longer. General Electric has equipped more than 2000 shovels and draglines with electric drive. For the past five years, the modern Amplidyne control has been a feature of nearly all large shovels and draglines equipped by General Electric. Without exception, owners of these electrified excavators have benefited from smoother, faster operation and greater shovel capacity per day. When you specify electrical equipment for your next shovel, make sure it is Amplidyne-equipped. Simply get in touch with your nearest General Electric field office for information and assistance. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

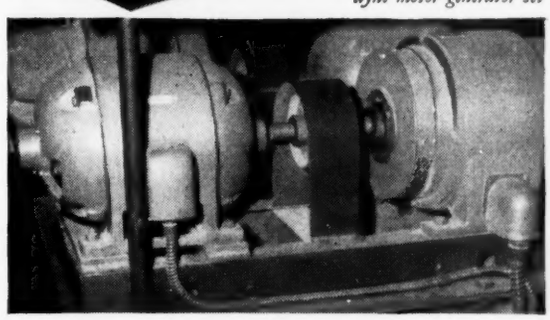
(Right) Type MDP mill motors provide great mechanical strength coupled with improved electrical characteristics



(Below) 7-unit a-c to d-c ball-bearing motor-generator set



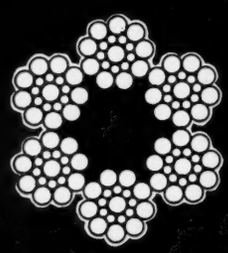
(Below) Typical amplidyne motor-generator set



GENERAL ELECTRIC

657-59

Best where wear is Hardest!



UPSON-WALTON
6 x 19 SEALE WIRE ROPE

FOR traction ropes on aerial tramways...for button conveyors and track cables . . . for car haulage systems, car pullers and spotters . . . for mine scrapers and slushers and slope haulages—many industries require a rope that is moderately flexible and still resists wear and abrasion to a very marked degree.

Upson-Walton Seale Layrite Perfection cable will outwear any other type of rope regularly used in this service. This is true because the rope is designed with coarser outer wires which can withstand abrasion longer.

Upson-Walton Seale is your best bet where the rope comes in contact with abrasive materials or is subjected to continual dragging on the ground. or where extreme friction and slippage are encountered.

Hemp center or, where conditions are most severe, IWRC (independent wire rope center).

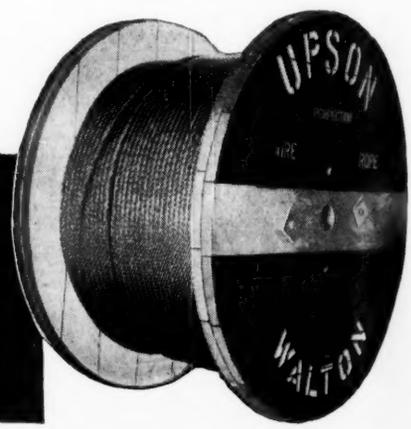
Perfection grade—because this improved plow steel is the strongest and toughest and most resistant to wear of all the grades of wire used to make rope.

Layrite—because this fine *pre*formed wire rope results in longer life, greater safety and greater economy.

U-W

Established 1871

Upson-Walton 6 x 19 Seale Perfection Layrite is best where wear is hardest!



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THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

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VACUUM CLEANER FOR HARBOR FLOORS

Another top performance by a BWH product

Keeping harbors safe for shipping is a tough, never-ending job. It calls for dredges to scoop up sand, mud, stone and other channel debris. The dredge's suction hose takes a real beating, because such highly abrasive materials pass through it constantly. What's more, the job must often be done in the face of strong variable winds and changing tides that buffet the vessel and subject the hose to severe strain.

No wonder the owner of a commercial dredging fleet was plagued by hose replacement problems . . . until he called on BWH for help.

Our engineers recommended Perfection Sand Suction Hose, designed especially for the hardest service. The tube through which all dredged materials must pass is made of the toughest, high-grade, wear-resistant rubber, tested for durability . . . in gauges to meet any operating needs.

An open-weave breaker strip fabric firmly welds rubber tube and carcass. To give the hose flexibility, a high-tensile spring steel wire is spirally embedded in the rubber. Plies of rubberized duck hold the wire firmly in place, and contribute to the general strength of the hose.

As a companion to Perfection Suction Hose, BWH recommended a Paramount wire-reinforced Dredge Discharge Sleeve. Used as the first connection between pump and pontoon line, the sleeve absorbs strain and prevents kinking. This worked perfectly. Hose and sleeve have now been in operation for a long period . . . proof of the economy of quality hose.

Perfection Sand Suction Hose is just one of the many quality products manufactured by BWH. Whatever your need for industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor, or write direct.

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3 TOURNAPULLS load coa...

... fill 28 to 30c

Working in the seam, Tournapulls got heape loads of coal fast. Coal weighed approximate 1500 lbs. per yard.

Carl V. Hill, Greeley, Colorado uses 3 high-speed Tournapulls to load, haul and dump 35,000 tons of "rush" coal into railroad cars.

DURING recent emergency, Carl V. Hill, Greeley, Colorado, contracted to supply 35,000 tons of coal to Great Western Sugar Co., who faced loss of 50% of beet crop because of shortage of fuel for processing. Seams at Coalmont, Colorado, lay beneath 16 to 27' of overburden, nearly a mile from waiting railroad cars. Hill assigned overburden removal to part of his LeTourneau equipment fleet . . . put 3 big rubber-tired Tournapulls to work loading out the coal . . . found Tournapulls' big load capacity and high-speed haul the answer to his problem of delivering coal to cars fast and at low cost.

Tournapulls hold high production

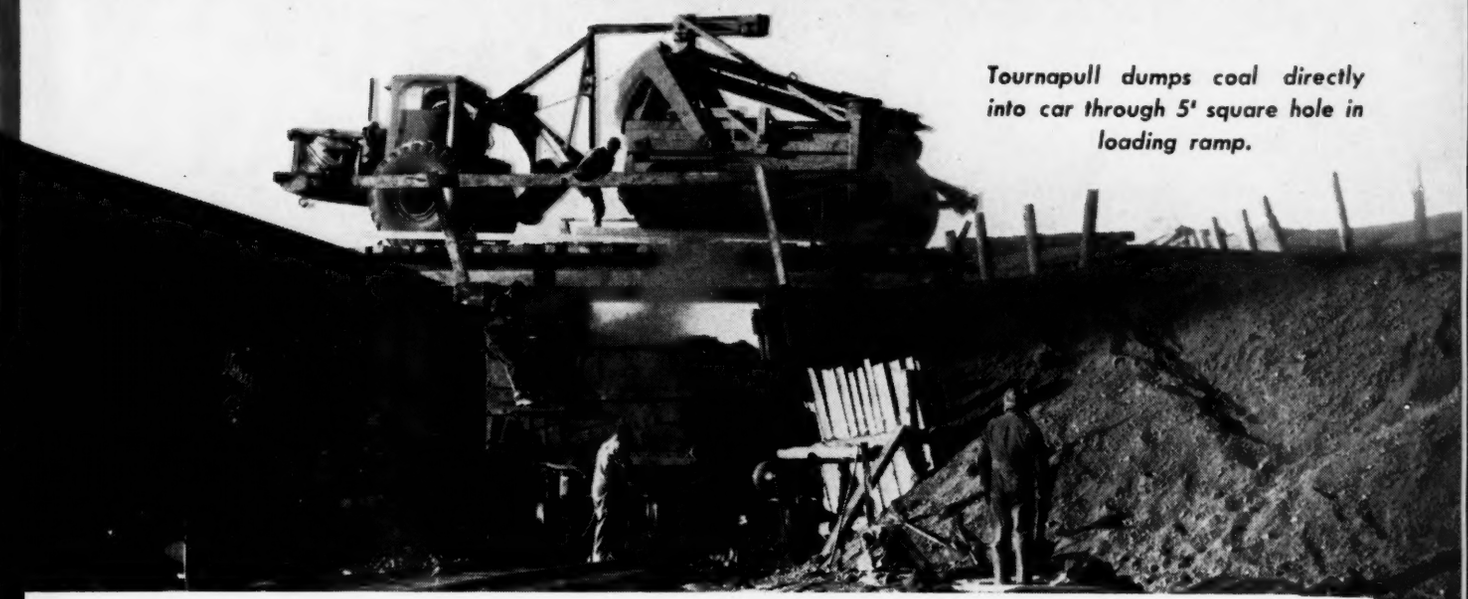
By using a LeTourneau Rooter, Hill kept the coal seam broken ahead of the Tournapulls for faster, easier loading. Rigs highballed big loads nearly a mile over well-maintained haul roads . . . dumped into waiting cars through 5' square deck opening in ramp, built of heavy bridge timbers. So fast and consistent was Tournapull performance, Hill reports that over the entire job his 3 Tournapulls loaded an average of 28 to 30 cars of 52-ton capacity every 9 hour shift.

This coal handling application is a typical example of Tournapull versatility around mines. Other profitable uses include stripping, haul road construction and maintenance, moving spoil banks, stockpiling. On any type of mining where haul or rehandling is involved, you, too, will find Tournapulls' big load capacity and high-speed haul the lowest-net-cost-per-yard answer . . . in all scraper materials . . . over long or short hauls . . . under tough mine conditions. Ask your LeTourneau Distributor for job-proved facts and figures on Tournapull performance.

FOR LOWEST NET COST PER YARD

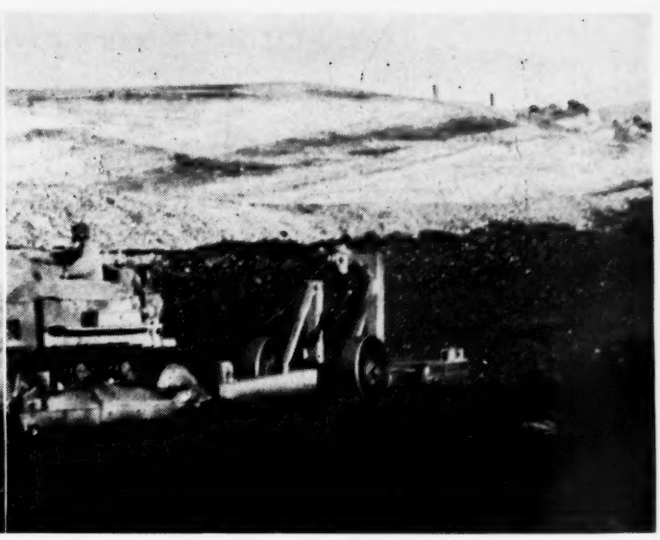
...haul nearly a mile

cars every 9 hours



Tournapull dumps coal directly into car through 5' square hole in loading ramp.

Tournapulls' high-speed haul plus well maintained roads gave more tons per hour.



Smart operation ... LeTourneau Rooter broke up coal for faster Scraper loading.

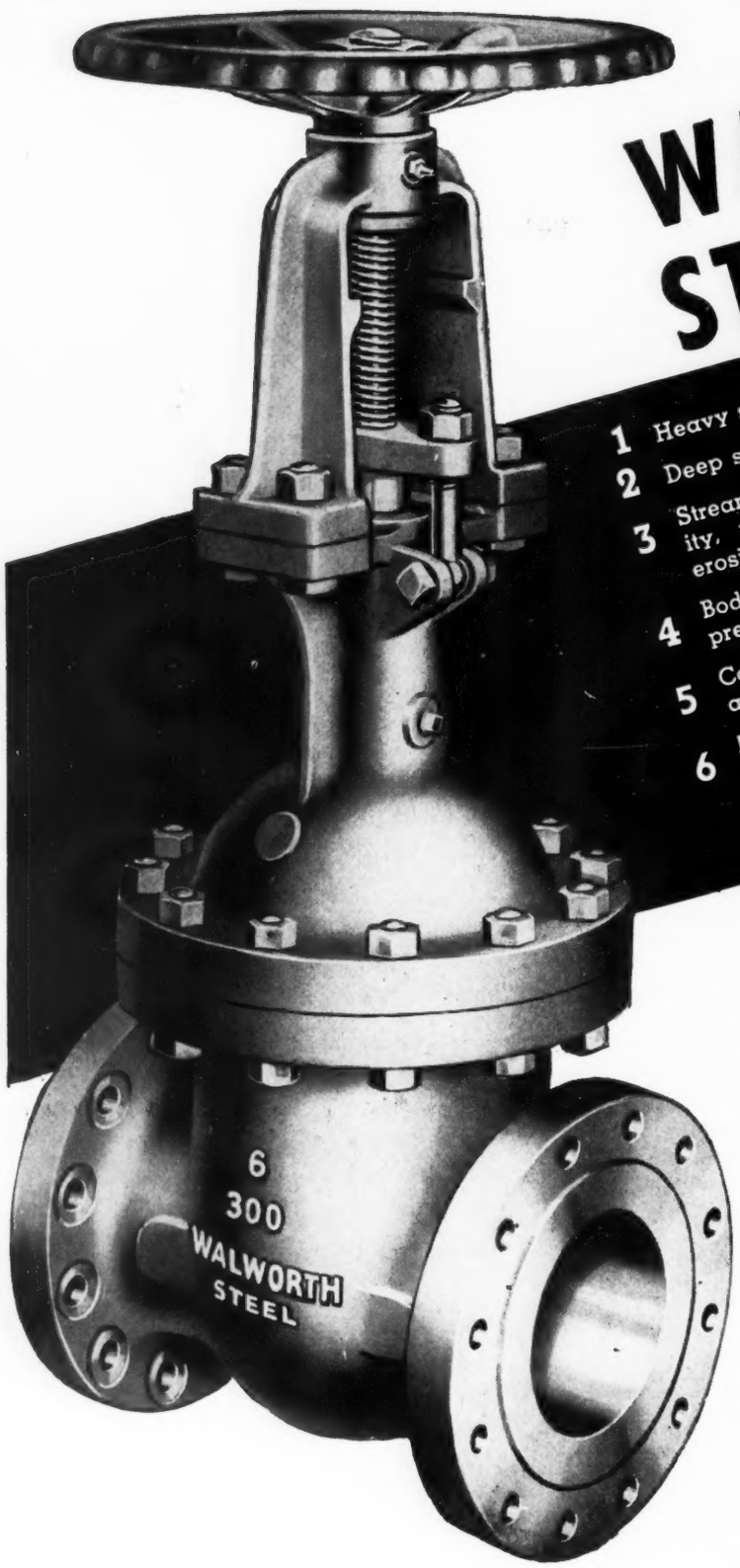
Stripping rigs had to hump to keep seam open ahead of Tournapulls.

LETOURNEAU PEORIA, ILLINOIS

JOB-PROVED Over 5000 Built and Shipped

TOURNAPULLS

You get all these BIG features in WALWORTH STEEL VALVES



1 Heavy steel walls for extra strength and protection.

2 Deep stuffing boxes to eliminate costly leaks.

3 Streamlined ports to make possible a high velocity, non-turbulent flow, and reduces possible erosion.

4 Bodies and bonnets engineered to withstand pressure and minimize distortion.

5 Cast body guide rib faces, machined to insure accurate disc centering.

6 Exact design, metallurgy and construction of yoke nuts, bonnet bushings, gland followers, handwheels and other vital parts to assure better service for a longer period of time.

Is there any wonder that out in the field, where approval is based on performance under actual operating conditions, industry has put its O.K. on Walworth Steel Valves?

Tough . . . wear resistant . . . dependable, these valves are produced in gate and globe types, in sizes to cover practically every service requirement. They are excellent examples of Walworth leadership . . . leadership that has made the Walworth valves famous throughout the world.

Walworth Catalog 42 gives complete information regarding Steel Valves as well as the full line of Walworth valves and fittings in bronze and iron. Your copy may be obtained upon request. Whenever you need valves — whether steel, bronze or iron — remember Walworth for dependability, economy, and long service life.

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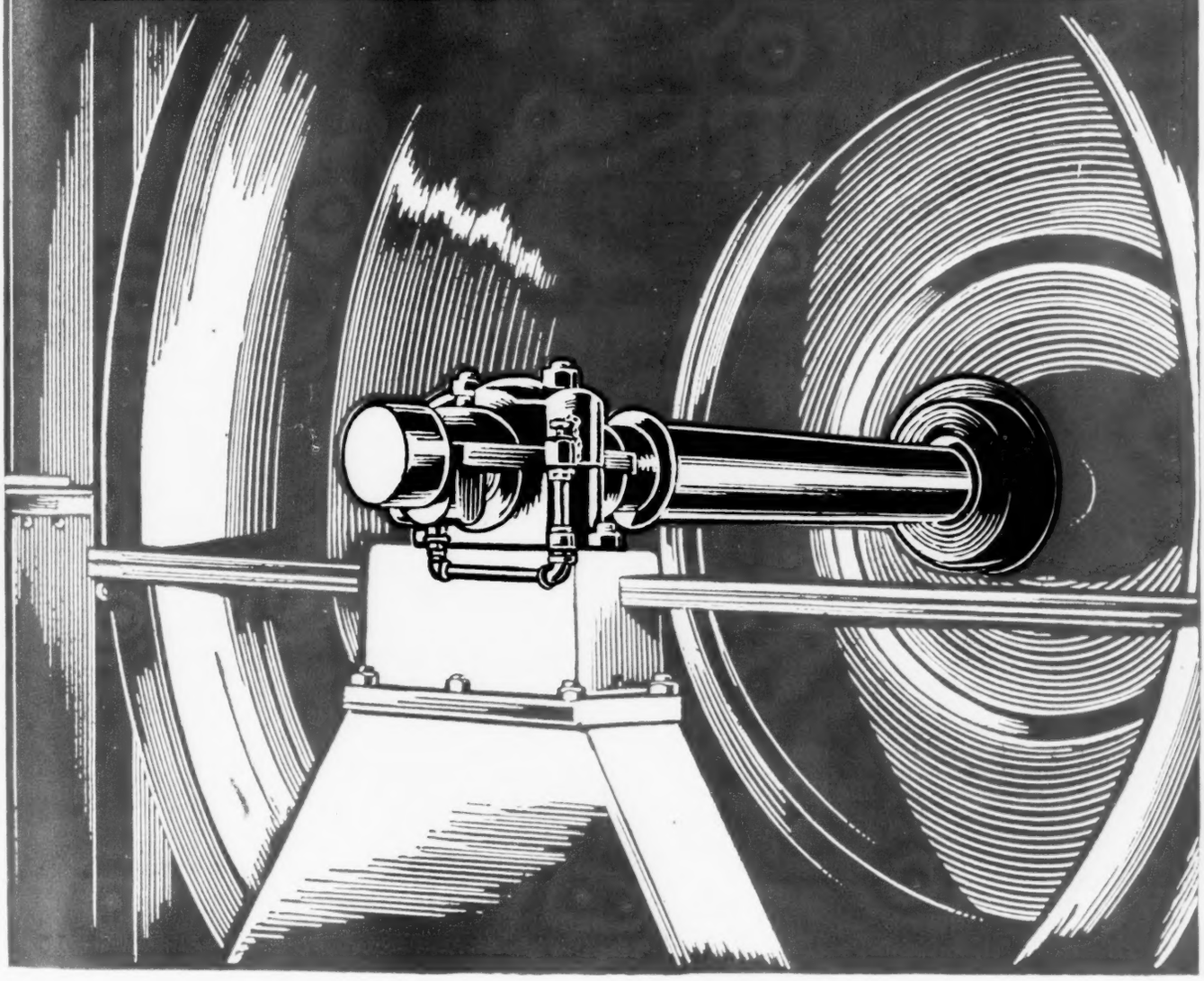
"BEARINGS RUN 10% COOLER



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INDUSTRIAL LUBRICANTS

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"Production speeded 65%...
Repair costs slashed 30%...
Deposits eliminated...
Highly stable...
Consumption cut 25%..."

This report from a plant engineer typifies the kind of trouble-free, cost-cutting lubrication provided by Tycol Industrial greases. They contain more high-grade cylinder oil—less soap—which means better performance in every application.

For aid in the selection of Tycol greases best suited for your particular needs, contact your nearest Tide Water Associated office today.

LUBRICATION—"ENGINEERED TO FIT THE JOB"

Yes, incredible as it seems, you get up to 90% longer wire screen life with Roebling's new Roe-Flat—and at no sacrifice in volume of screening production. The secret lies in Roe-Flat's unique crimp, with its absolutely flat wearing surface. It brings to your screening job the combined advantages of both maximum open area and heavier wire diameters.

GET MORE WITH ROE-FLAT

More metallic wearing surface...75% more than ordinary crimps! Roe-Flat has no raised intersections to wear out first.. wear is distributed uniformly over nearly all the wire surface.

More screening production... because Roe-Flat's parallel wires on the same plane mean less blinding.

More accurate screening... and less re-screening needed, because of the accurate-sized openings in Roe-Flat.

More resistance to abrasion, wear and fatigue... the result of using improved quality steel in Roe-Flat.

A Roebling Field Engineer will gladly show you the savings possible with Roe-Flat... both on your average screen costs and on your over-all processing operation. Call him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
Woven Wire Fabrics Division
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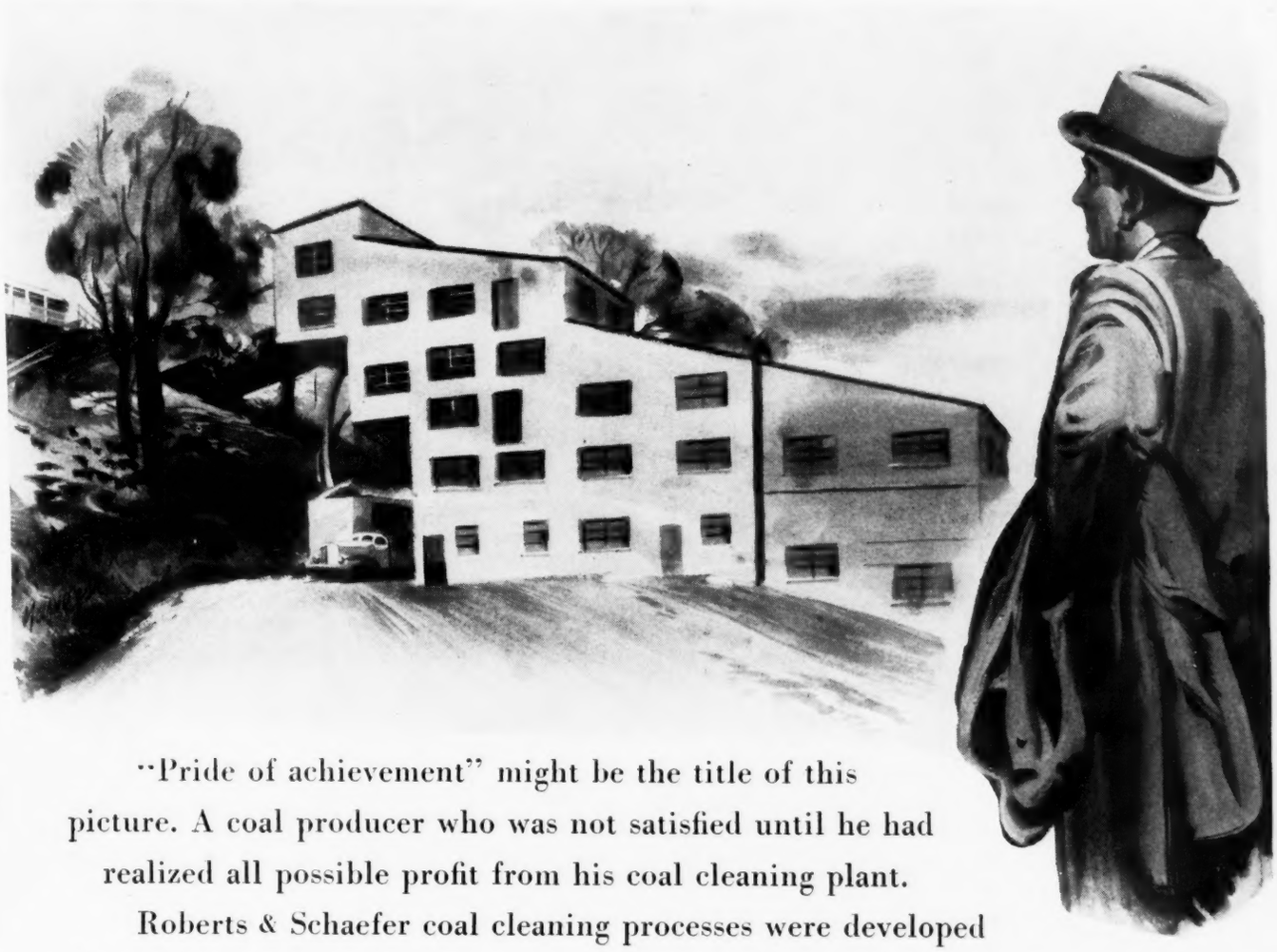
Manufacturers of Wire Rope and Strand • Fittings • Slings • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Aerial Wire Rope Systems • Electrical Wire and Cable • Ski Lifts • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers

ROEBLING

A CENTURY OF CONFIDENCE

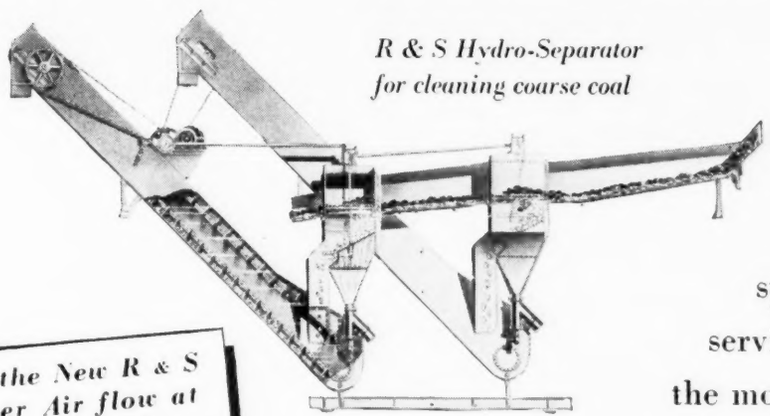
HERE IS A MAN WHO KNOWS HOW TO MAKE HIS COAL PAY —



"Pride of achievement" might be the title of this picture. A coal producer who was not satisfied until he had realized all possible profit from his coal cleaning plant.

Roberts & Schaefer coal cleaning processes were developed for this man. The Hydro-Separator for coarse coal 6" x ¼", Hydrotator for fine coal and the Stump Air Flow for dry cleaning. These units and Roberts & Schaefer specialized engineering service combine to produce the most profit from mine output.

Ask about them today.



R & S Hydro-Separator for cleaning coarse coal

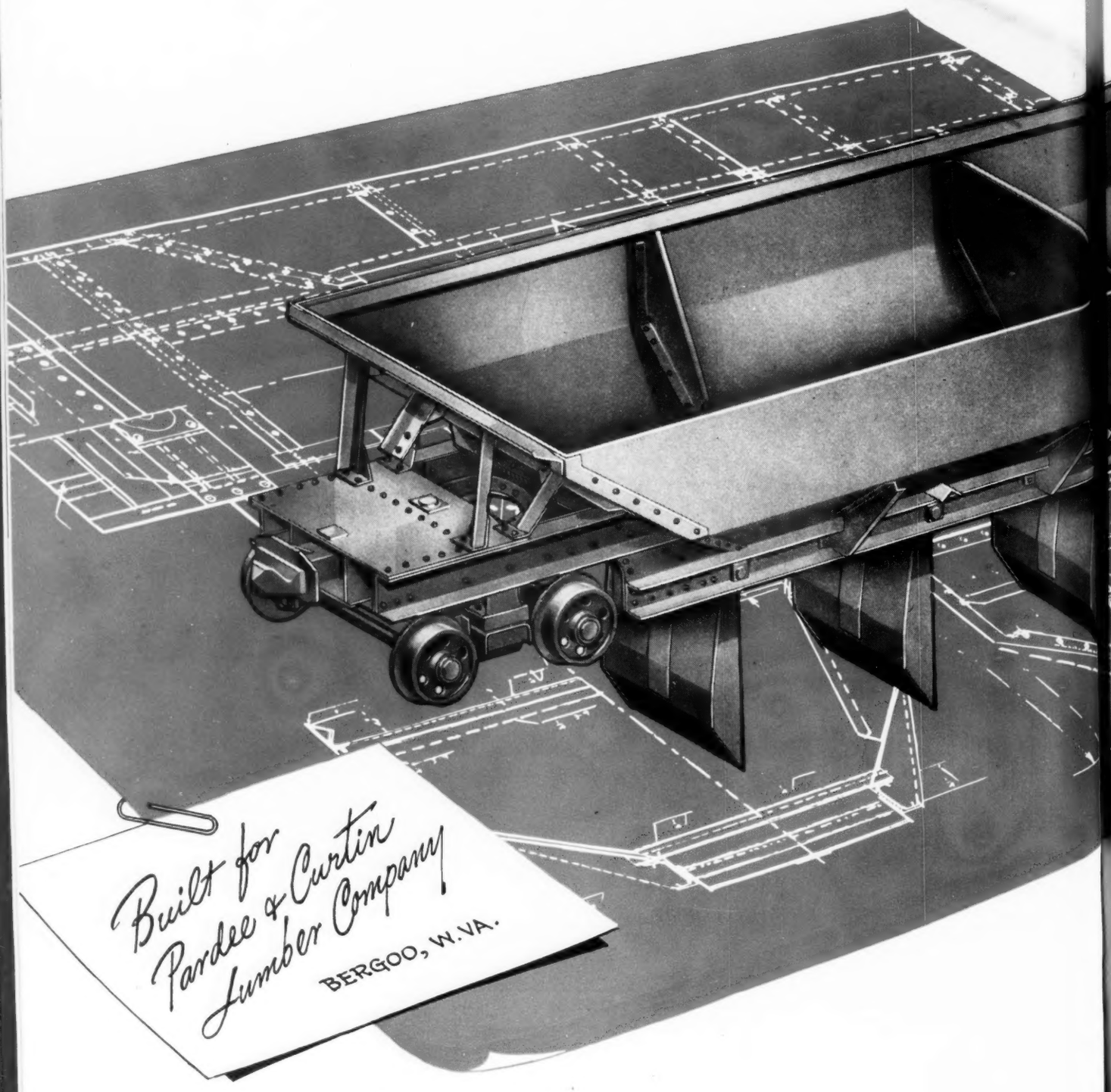
See the New R & S Super Air flow at the Coal Show Booth No. 1000

ROBERTS and SCHAEFER CO.

307 NORTH MICHIGAN AVENUE • CHICAGO 1, ILLINOIS

2221 Oliver Building, Pittsburgh 22, Pa. • P. O. Box 370, Huntington, W. Va.

High-speed Haulage ...Rapid Unloading 8-Wheel



See it... in Person! AT THE CLEVELAND COAL CONVENTION AND EXPOSITION • MAY 12th to 15th • BOOTH Nos. 505-509

Drop Bottom Mine Car.

It's NEW!...It's REAL!

Here's the car that is ideally suited to mechanical mining! High Speed haulage coupled with rapid unloading allows more car trips per shift—resulting in higher production and lower costs per ton of coal mined. Fewer cars are required to handle a specified tonnage—because of the saving in dumping time!

This car is Big! It carries 12 tons of coal easily. It unloads quickly—automatically—without stopping the car trip. This saves precious time which can be used for greater loading efficiency—to increase production!

Perhaps cars of this type will be the answer to your transportation problems? Our Sales Representatives will be glad to explain the many features of this new A.C.F.-Eight-Wheel Drop Bottom Mine Car to you.

American Car and Foundry Co.

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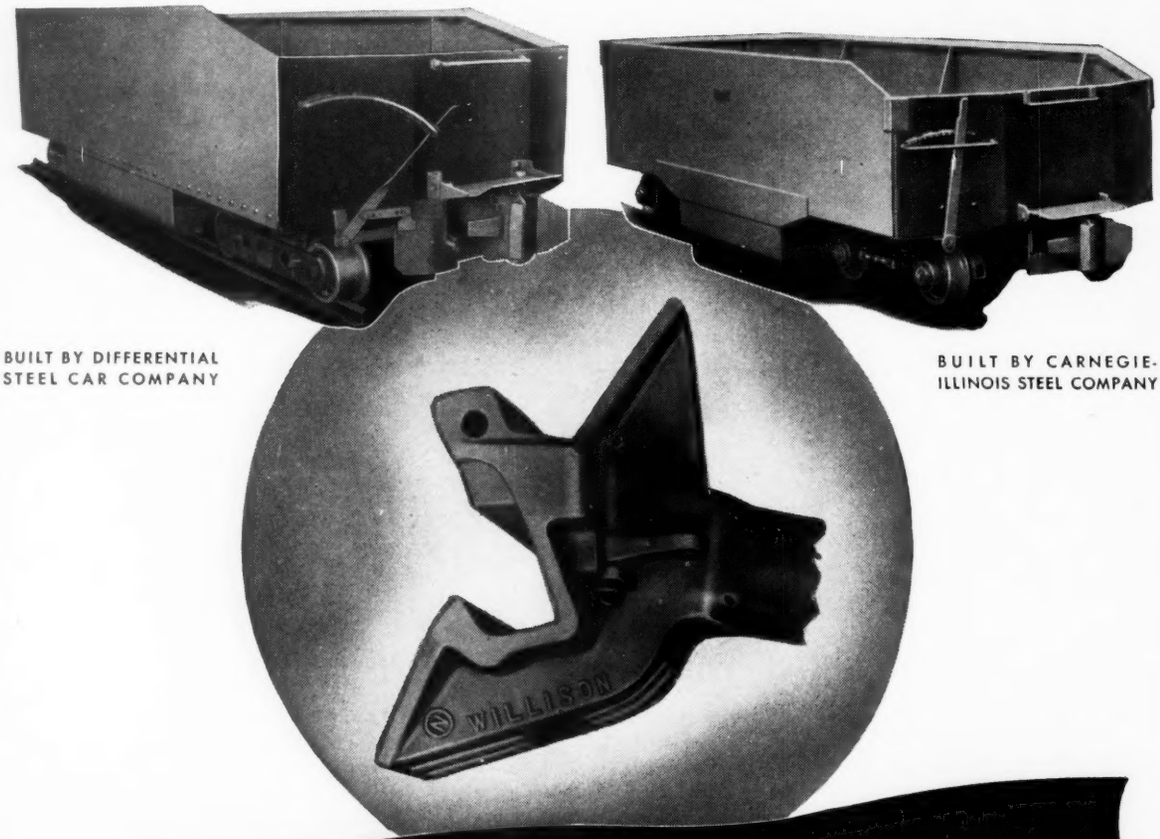
MINE CARS



SPEED WITH SAFETY

... FOR THE WORLD'S LARGEST MINE

They move coal faster, safer, at less cost, at the H. C. Frick Coke Company's Robena Mine because 1600 mine cars, as well as supply cars and locomotives, are equipped with Willison Automatic Couplers of the self-centering type.

These modern couplers permit swift and sure gathering and shunting with less coal spillage. At Robena Mine, entire trains of cars are unloaded on rotary dumps, without uncoupling. All this means greater speed, greater safety, more tonnage per day at less cost.

These improvements in speed, safety and economy have been proved by many mine operators. Our engineers will work with you and your car builders to help you obtain the same profitable results with Willison Automatic Couplers.

N M&S Co

ESTAB. 1868

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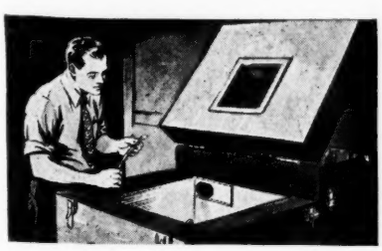
UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

COLD RESISTANT



DEEP FREEZE TEST—Scientists—using specially designed equipment—subject U. S. Mining Machine and Locomotive Cables to a cold rarely encountered by man . . . minus 45 degrees F. This is one of the several ways of testing the dependability of U. S. Royal Cords and Cables.

Cold . . . cold . . . you bet it's cold! Minus 45 degrees Fahrenheit, to be exact.

That's the freeze test U. S. Royal Cords and Cables with Neoprene jackets must pass . . . before U. S. Rubber Company scientists pronounce them cold-resistant.

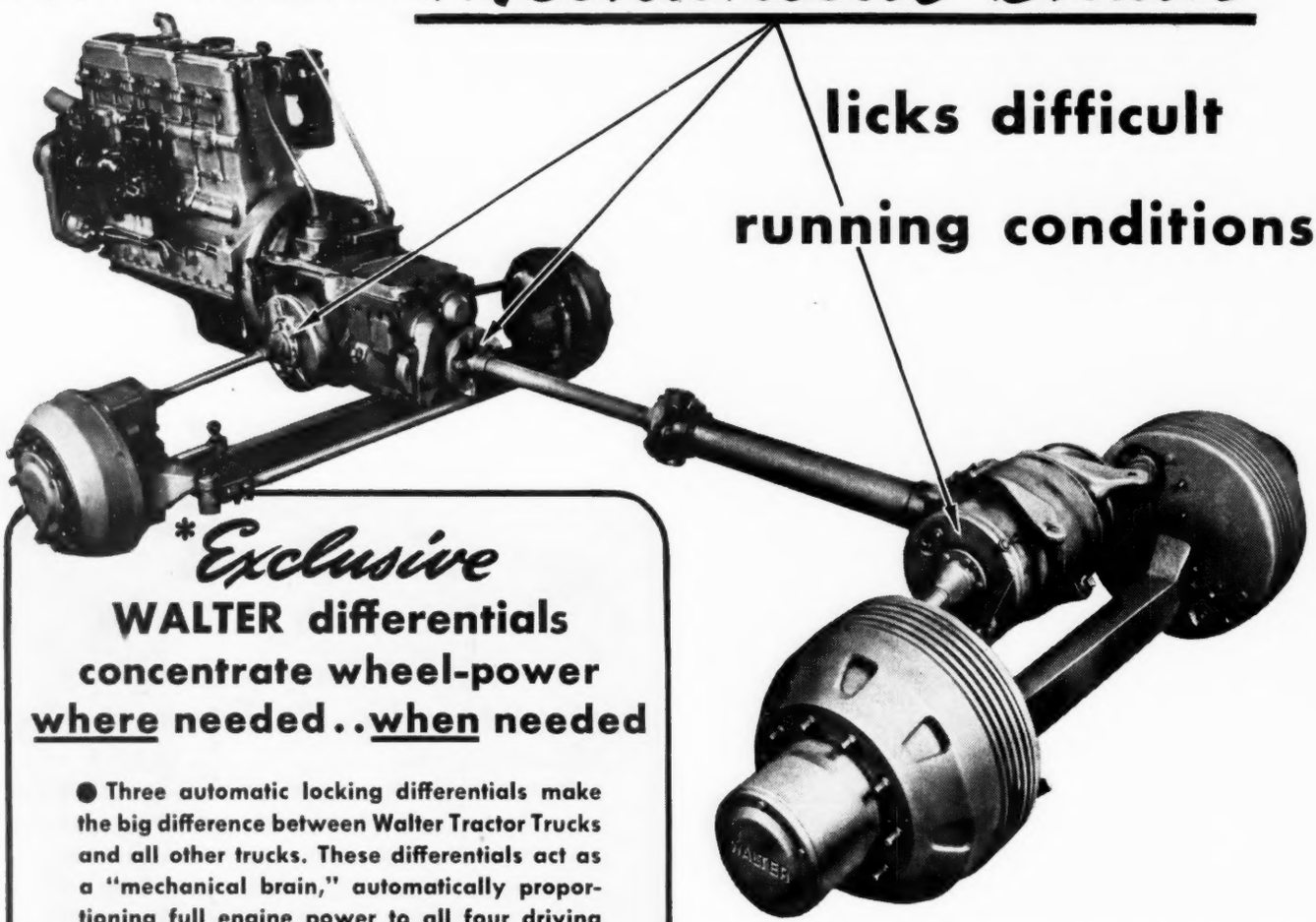
U. S. Royal Cords and Cables are also bent, twisted, stretched, pounded, and soaked in water. Specially designed torture machines are used. Once the Cables pass all these tests, you can bet your net dollar they're completely "Safety-Tested" and ready for the toughest working conditions. The Neoprene jacket provides resistance to oil and gas.

Visit the U. S. Rubber Company exhibit at the Convention of the American Mining Congress in Cleveland, May 12-15. Booth No. 1550.

THE NEW U. S. ROYAL *Safety Tested*

MINING MACHINE AND LOCOMOTIVE CABLES

How WALTER *"Mechanical Brain"** licks difficult running conditions



*Exclusive WALTER differentials concentrate wheel-power where needed..when needed

● Three automatic locking differentials make the big difference between Walter Tractor Trucks and all other trucks. These differentials act as a "mechanical brain," automatically proportioning full engine power to all four driving wheels according to the traction of each at any instant. If one, two, even three wheels lose traction, power is automatically concentrated on the mates, which carry on until full traction is regained. There are no helpless spinning wheels to slow or bog down the truck on soft or slippery surfaces.

OPEN PIT MINING calls for more than conventional heavy duty trucks which waste valuable power on slipping wheels. It calls for a stamina-packed truck which powers the "*working wheels*," no matter what the running conditions. It calls for Walter Tractor Trucks—the only trucks with the "mechanical brain" to assure unfailing tractive power.

Designed in every detail for open pit hauling, Walter Tractor Trucks haul bigger payloads (up to 60 tons) in any weather, on soft or slippery surfaces, up steep grades. And they do it at speeds equalling much smaller trucks. The smooth, tractive power minimizes damage to mine roads.

Walter Tractor Trucks also incorporate other important engineering features: Suspended double reduction drive—tractor type transmission—high ground clearance—minimum unsprung weight—easy maneuverability—models from 125 to 350 hp. Send today for detailed literature.

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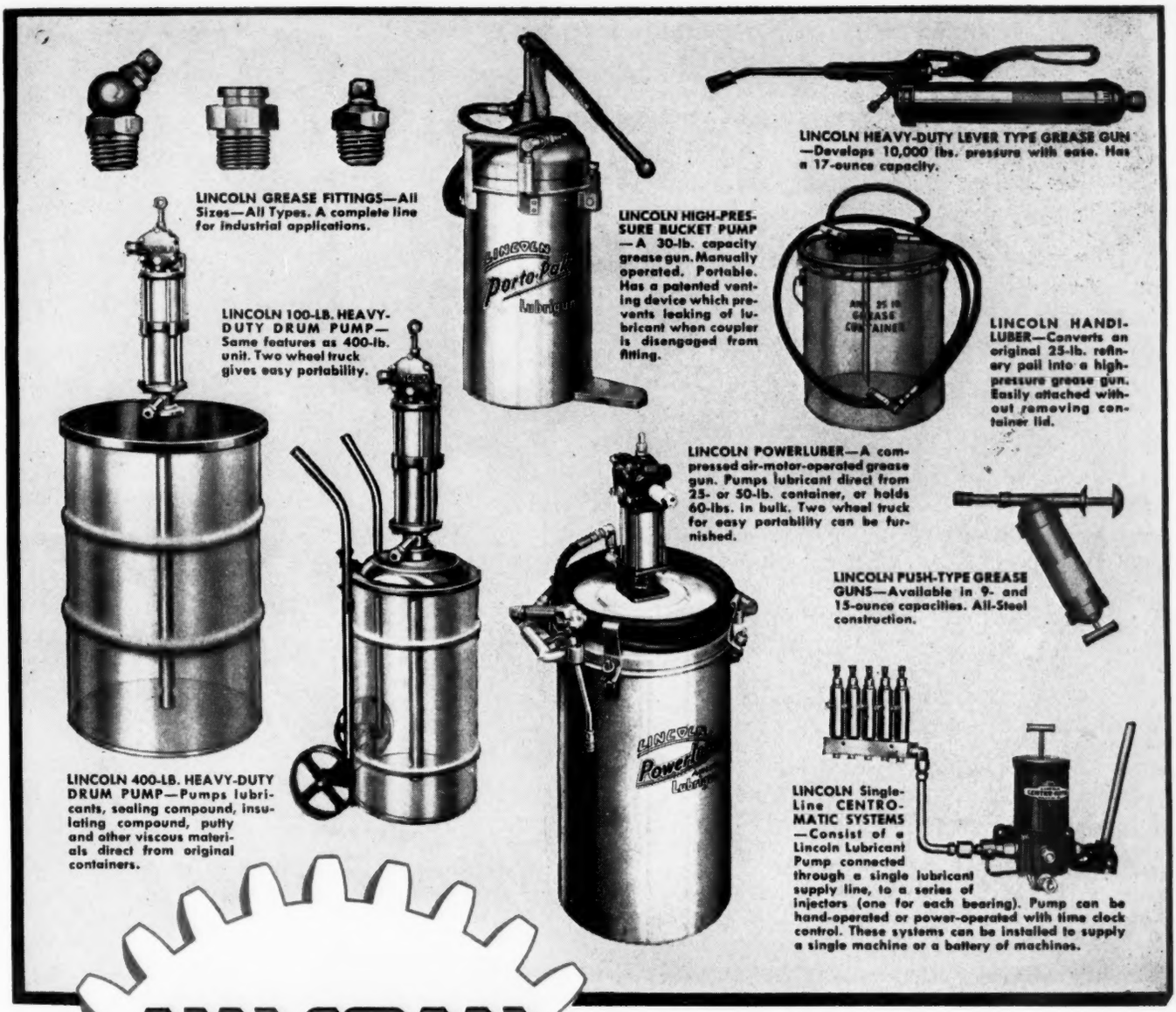
WALTER TRACTOR TRUCKS


LINCOLN GREASE FITTINGS—All Sizes—All Types. A complete line for industrial applications.
LINCOLN HEAVY-DUTY LEVER TYPE GREASE GUN—Develops 10,000 lbs. pressure with ease. Has a 17-ounce capacity.
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LINCOLN POWERLUBER—A compressed air-motor-operated grease gun. Pumps lubricant direct from 25- or 50-lb. container, or holds 60-lbs. in bulk. Two wheel truck for easy portability can be furnished.
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Stubborn lubrication problems are being solved daily through the use of Lincoln Lubricating Equipment. The line is complete and includes everything needed to give industry top lubrication efficiency. A few of the many Lincoln products are illustrated above.

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ASK YOUR *Lincoln* WHOLESALER

He has experienced men ready to help you with your lubrication problems and can supply your requirements. If there is no Lincoln wholesaler convenient, mail coupon for literature and complete information.

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One sure way to keep your loaders working on full time schedule is to equip these machines with *Whitney Universal Mining Chain.* Tough and rugged, Whitney Chains are made to take the gruelling service encountered in coal mines. Their heat-treated, alloy steel parts assure maximum durability . . . reduce wear . . . and cut maintenance. The accurately machined Universal joints are constructed of steel forgings for toughness. Flight studs are fully machined and have milled threads. End pins are riveted into deep countersinks in the forging to provide maximum anchorage. Roller chain parts are of alloy steel, hardened to provide extreme strength and to withstand shock loads encountered in mine service.

Remember too, that accurately made Whitney Cut Tooth Sprockets play an important part in overall Drive efficiency . . . are accurately designed to insure smooth operation and long life.

It will pay you to standardize on Whitney Chain Drives. See the nearest distributor serving your territory or write:

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MAY 12-15th

THE "welcome mat" will again be down at this convenient, friendly hang-out for all who are interested in modern mining equipment and supplies*. Come, mingle with your old friends and make new ones in this popular rendezvous.

*American Steel & Wire Company Products include American Tiger Brand Wire Rope — Aerial Tramways — Tiger Brand Wire Rope Slings, Clips and Wire Rope Fittings — Electrical Wire and Cable — Tigerweld Rail Bonds — Amerclad All Rubber Cable — Bore Hole Cable — Ampyrol Insulated Wire and Cable — Amerbestos AVC Cable — Trolley Wire.

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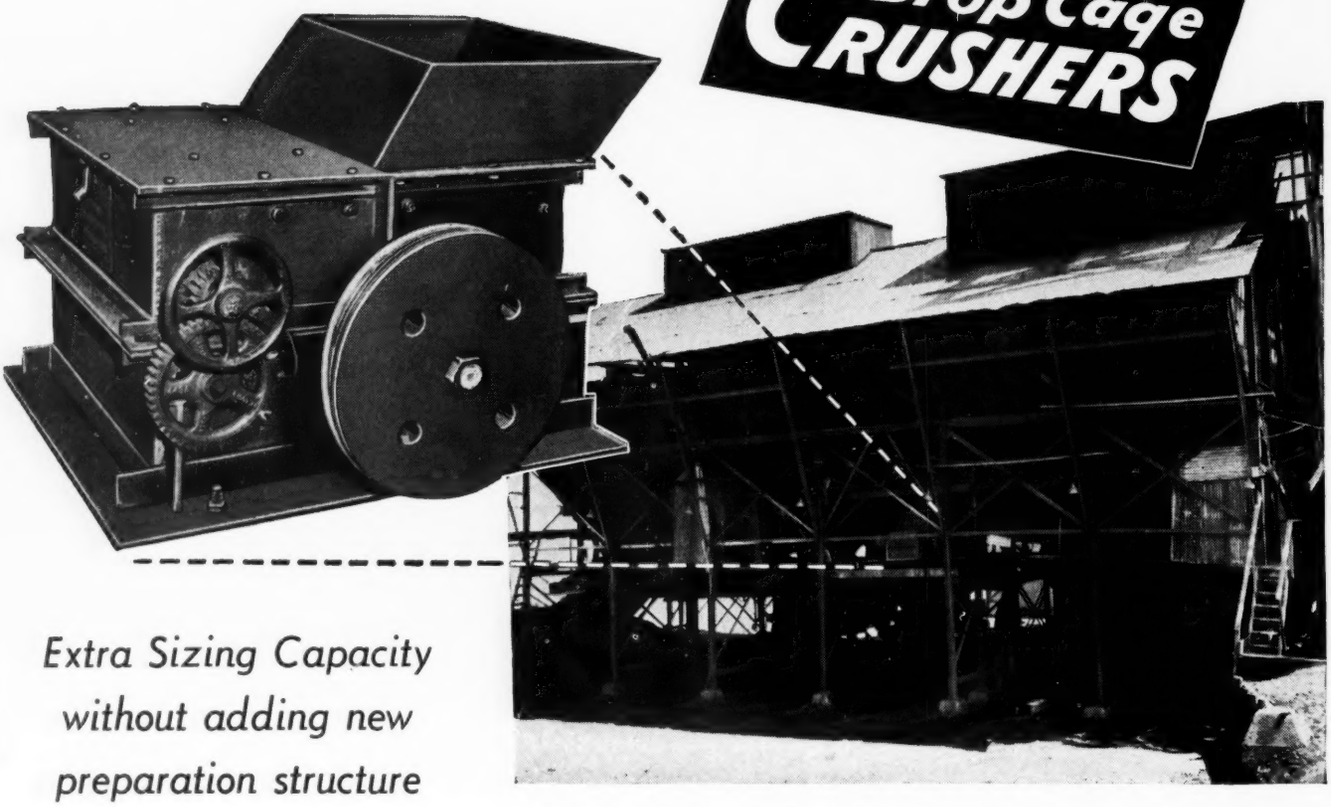
UNITED STATES STEEL

The BIG Demand is for Tiger Brand

MARKETING FLEXIBILITY *added without extensive plant alterations*

with **AMERICAN Drop Cage CRUSHERS**



Extra Sizing Capacity without adding new preparation structure

Mine preparation plants and service facilities frequently are confronted with market demands beyond their capacities. These installations have been erected without due regard to changing conditions. As a consequence they have limited flexibility in meeting new situations or increased demands excepting through excessive conversion expense.

Such a problem was encountered by the Perry Coal Company at its St. Ellen Mine, near O'Fallon, Illinois. In this instance, the problem was handled by the installation of an American Drop-Cage Crusher strategically placed under its nut coal bin. With such a location the coal either may be fed by gravity, direct from the bin to the crusher and converted into 3/4 inch screening for truck loading, or it may be loaded from the bin into trucks by-passing the crusher.

Through this arrangement an additional size of coal is available for customers' requirements with substantial storage capacity enabling the company to give its usual prompt service. This installation has added new flexibility to the plant without extensive plant revision, without disrupting production and at a minimum cost.

Can your plant benefit and increase its flexibility with such an installation?

Write for details on the American Drop-Cage Crusher

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

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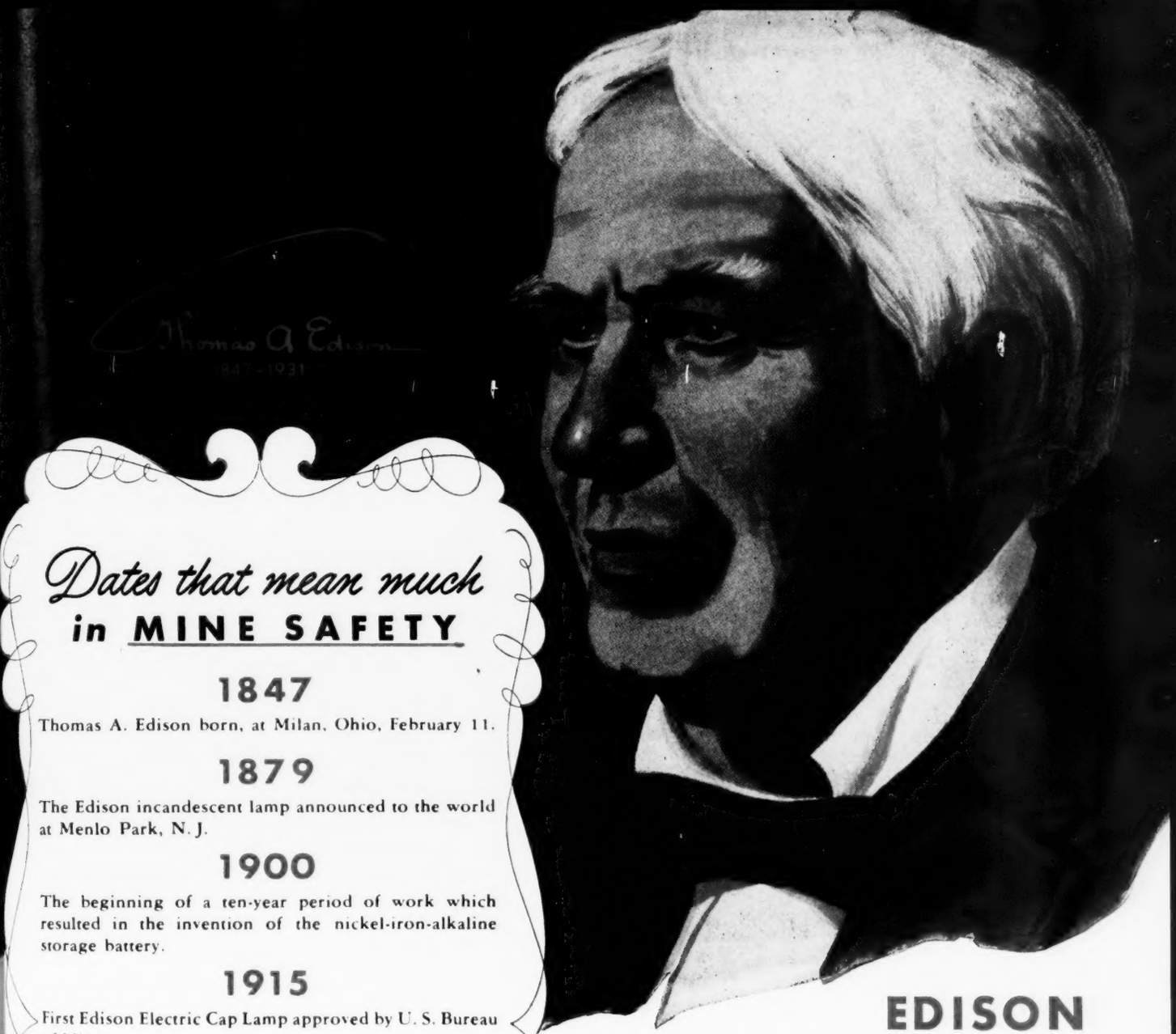

Dates that mean much in MINE SAFETY

1847

Thomas A. Edison born, at Milan, Ohio, February 11.

1879

The Edison incandescent lamp announced to the world at Menlo Park, N. J.

1900

The beginning of a ten-year period of work which resulted in the invention of the nickel-iron-alkaline storage battery.

1915

First Edison Electric Cap Lamp approved by U. S. Bureau of Mines.

1947

Edison Electric Cap Lamps now provide over 600,000 miners around the world with better, safer illumination.

EDISON
ELECTRIC
CAP LAMPS

M·S·A
COMFO CAPS

The Edison Electric Cap Lamp represents three great achievements of Mr. Edison: the development of the incandescent lamp; the nickel-iron-alkaline storage battery; and the design and construction of the combination of these into safe, effective illumination for the miner.

Continuously improved since its introduction, the Edison Electric Cap Lamp today is the standard of the mining industry —indispensable throughout America and the world.

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MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.
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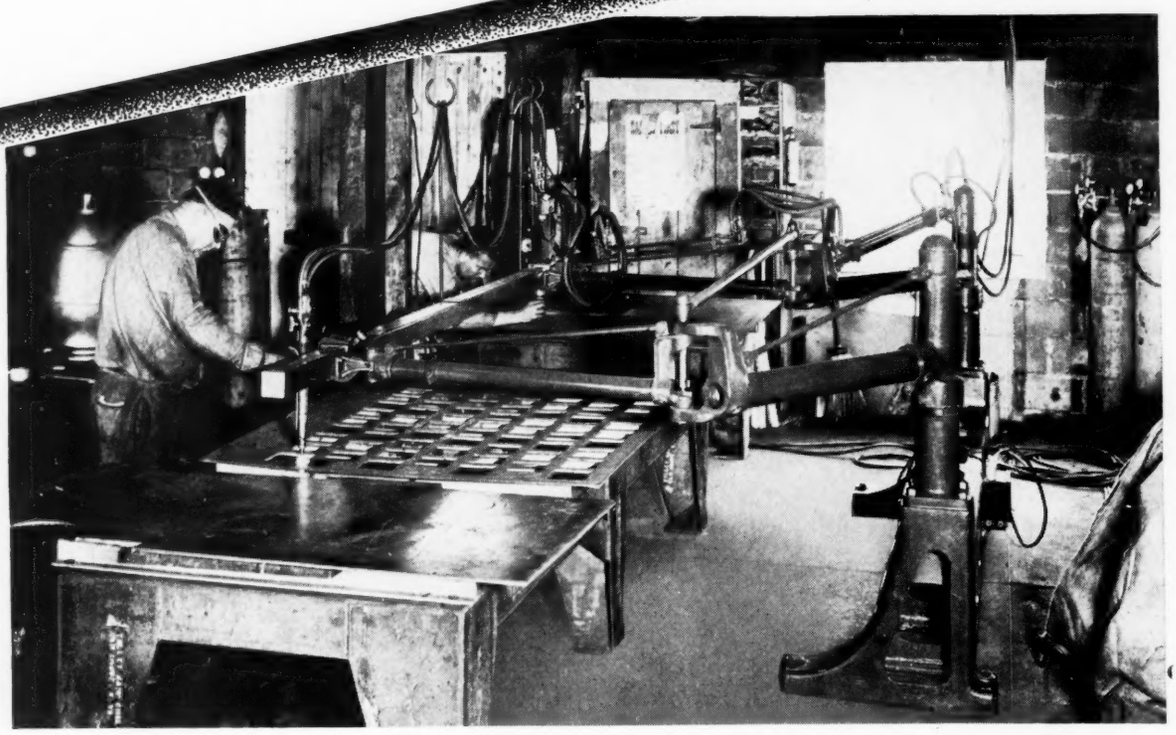
Repair, Rebuild, Fabricate

efficiently and at low cost



with welding and flame cutting equipment

The continuous wear to which mine equipment is subjected decreases operating efficiency, and is costly in the high replacement of parts. Many mines are solving this problem by the full use of the oxyacetylene flame and electric arc in maintenance and fabrication work.

For example, a flame-cutting machine in one colliery is used to cut grading screens from steel plate . . . equipment that can often be made at less cost than a new replacement.

Also, this flame cutting equipment is used to shape steel sheet and plate for mine cars . . . and together with the electric arc helps to build new sections or entire bodies . . . reduces "down time" on machines for which repair parts are not readily available . . . eliminates the necessity of having capital tied up in large stocks of spare parts – they can be made as needed in repair shops.

These are just a few of the many profitable Airco oxyacetylene flame and electric arc applications in and around mines. Others include welding of rail ends to form one continuous rail . . . flame hardening of machine parts . . . rebuilding of worn surfaces . . . hard facing of equipment subjected to wear . . . and numerous other repair jobs.

For further information about these cost-cutting, time-saving processes write for the explanatory article — "Welding, Flame Cutting For Efficient Maintenance and Low Cost". Address: Dept. CA-6023, Air Reduction, 60 East 42nd St., New York 17, New York. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

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MAYBE YOU'RE NOT INTERESTED IN PINEAPPLE JUICE

. . . but

you may have the same problems of contamination, corrosion, suspended solids and mechanical remote control which prompted the engineers of The Dorr Company to select Grinnell-Saunders Diaphragm Valves for the Dorrco De-Ionization System for the new plant of the Hawaiian Pineapple Co. in Honolulu.

YOU, too, may find your answer to valve troubles due to corrosion, contamination or suspended solids in

GRINNELL-SAUNDERS DIAPHRAGM VALVES

ISOLATED WORKING PARTS

The flexible diaphragm isolates working parts of the valve from the fluid, preventing contamination or corrosion.

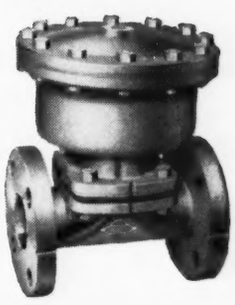
CORROSION-PROOF LININGS

A selection of diaphragm materials and also body linings of glass, porcelain, lead, rubber or synthetics to suit service requirements.

STREAMLINED FLOW . . . POSITIVE CLOSURE

Streamlined passage without pockets minimizes friction. Large area of contact of the diaphragm, plus diaphragm resilience, permit positive closure even when solids are trapped.

Standard valve available in screwed and flanged types.



Neoprene-lined, piston-operated valve specified by The Dorr Company for mechanical remote control.

Write for catalog—Grinnell-Saunders Diaphragm Valves

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Executive Offices: Providence 1, R. I.

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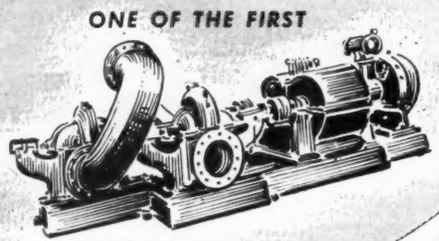
GRINNELL

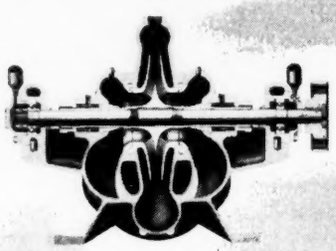
WHENEVER PIPING IS INVOLVED

45 Years of PUMP IMPROVEMENT

ONE OF THE FIRST

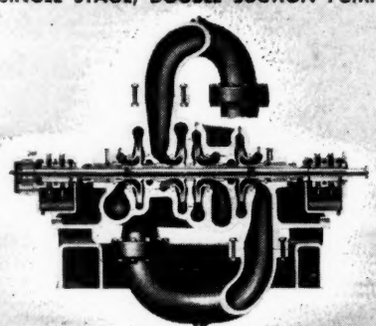


Built by De Laval in 1902

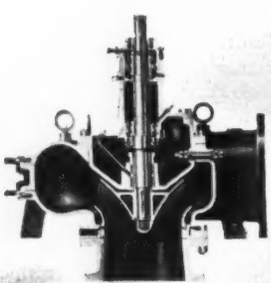


SINGLE STAGE, DOUBLE SUCTION PUMP

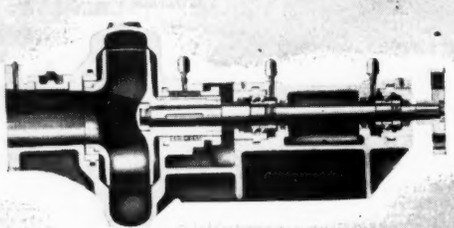
Modern De Laval centrifugal pumps represent the culmination of more than 45 years of continual improvement and perfection. This long period of concentration upon the problems of centrifugal pump design and application places at the user's command a complete line of modern, high quality pumps and a vast store of knowledge concerning pump application problems.



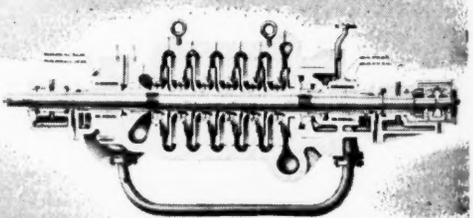
FOUR STAGE, OPPOSED IMPELLER PUMP



MIXED FLOW PUMP



CLOGLESS PUMP



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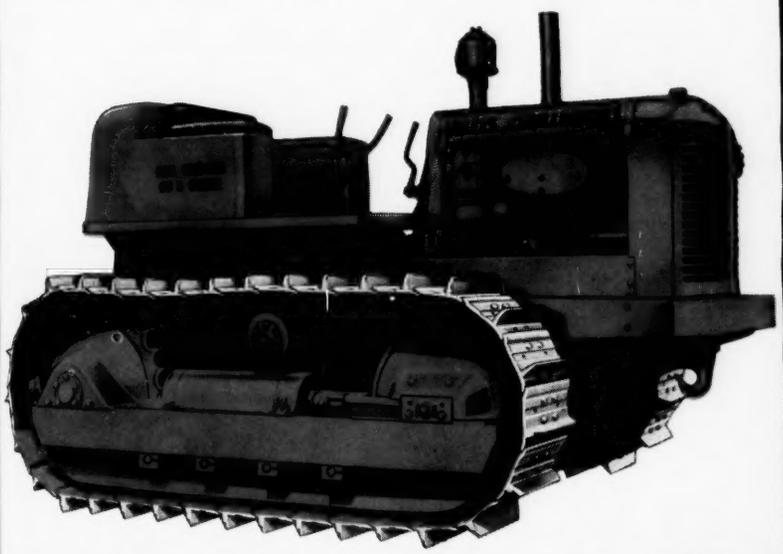

New Allis-Chalmers HD-5 and Its Allied Equipment Match Fully and Completely

- Result of finest kind of cooperation between the various Allied manufacturers and the entire Allis-Chalmers organization, its dealers and users.
- Backed by the knowledge, experience, and facilities of each manufacturer . . . each skilled in his own field . . . each firmly established in his own right.
- Specialized design and engineering. Allied equipment was developed and tested along with the HD-5 . . . made to fit exactly and to perform with maximum efficiency.
- Both tractor and equipment sold and serviced by the same organization — exclusively by Allis-Chalmers dealers throughout the country.

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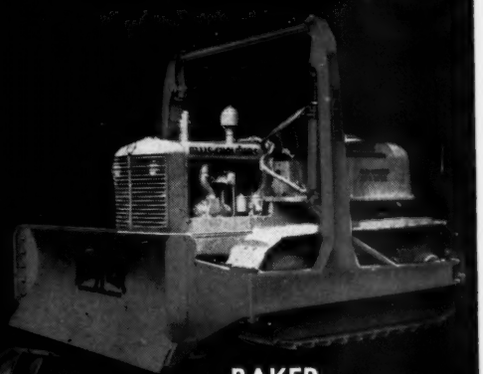

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Steel Grid Resistors
for COAL MINES
Since 1915

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The Nonbreakable Steel Grid Resistor

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. . . a complete, compact, semi-portable

HEAVY MEDIA SEPARATION PLANT

PAY AS YOU DEVELOP . . . PAY AS YOU PRODUCE

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1. **MONTHLY RENTAL.** Use this plan when initial capital investment is not justified.
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HMS "Mobil-Mill" is prefabricated for ease of erection and pre-engineered for balanced pulp flow. Now, mass production techniques developed by WKE engineers introduce new equipment and milling economies to the mining industry at lowest initial cost. "Mobil-Mill" is ideally suited for base metals, non-metallics, coal and wherever the HMS process is applicable.

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5-FOOT CONE PLANT

- 5 to 15 TPH Cone Feed

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For further information write to:

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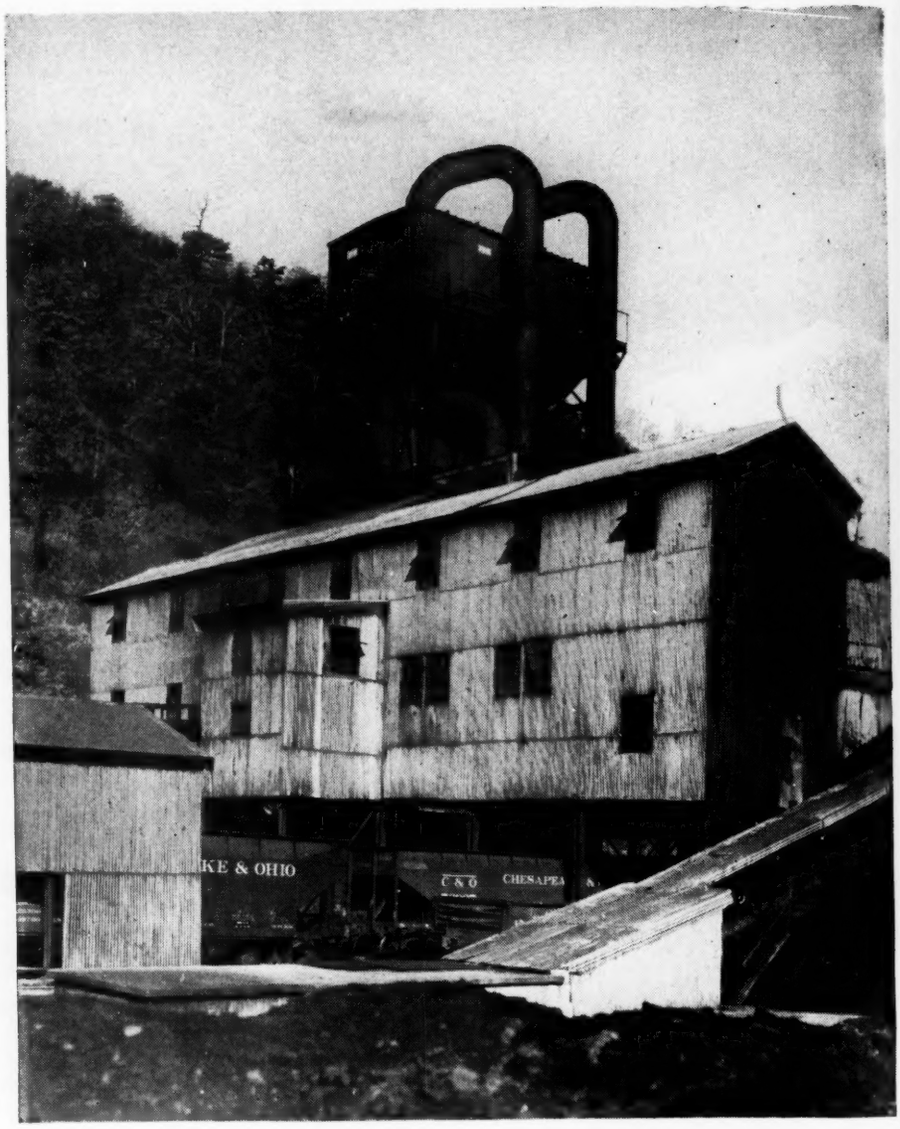
Pangborn Makes Coal Dust Behave



Desire for increased safety and improved working conditions—lower-cost equipment maintenance—efficient coal dust disposal and reclamation—elimination of nuisances—is responsible for the large number of Pangborn dust control installations in coal preparation plants.

For many years a "Pangborn" has been the recognized method of effectively collecting the fine coal dust that is produced in the operation of tipples, dry cleaning, de-dusting and other coal preparation facilities.

With this background of successful experience in the coal industry, Pangborn engineers offer you an effective and economical solution to your dust problems.

Write for free Bulletin 909A, "The Control of Industrial Dust". Address Pangborn, *world's largest manufacturer of dust control and blast cleaning equipment,* at 288 Pangborn Boulevard, Hagerstown, Maryland.

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Listen to the Voice of Firestone every Monday evening over NBC

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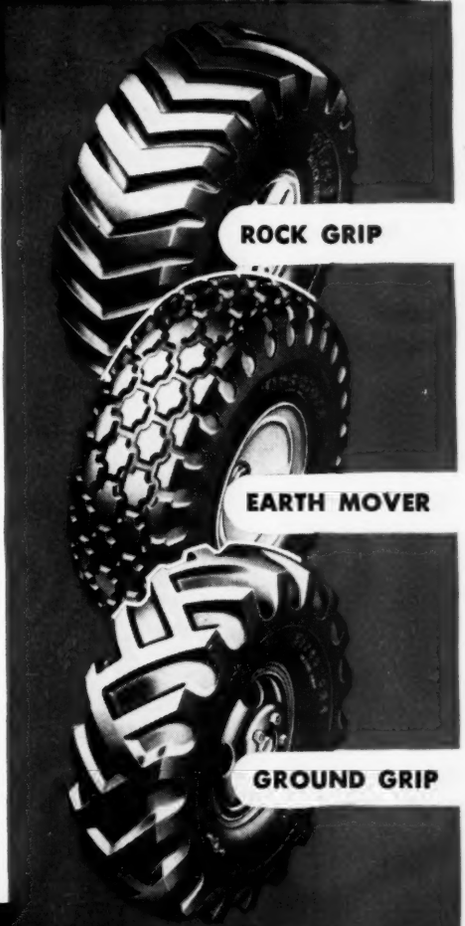

Firestone OFF-THE-HIGHWAY TIRES

BITUMINOUS COAL
Mining Towns
NORTH SOUTH EAST WEST
PICTORIAL STORY OF THEIR PROGRESS
These scenes, typical of the best, show what can be done and what has been done in the betterment of the living conditions of the men who mine the nation's No. 1 fuel. Not all mining communities are as modern and fine as those shown in this book, but the pictures do illustrate how
Mountain, Virginia

Pictures of Progress

IN THE WAY MINERS LIVE

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To Pin Down Facts

Photographs provide informal close-ups of the people, places, facilities, and events in typical modern mining towns. Descriptive text points out that the standard of living of an average miner and his family, while not luxurious, is far from poor . . . that in general, it compares very favorably with national averages.

This brochure is part of the broad public relations program which the Bituminous Coal Institute conducts in your behalf. Copies of the booklet have been put in the hands of editors, publishers, columnists, radio commentators, and libraries throughout the country. It has been offered to teachers and educators through B.C.I. advertising in professional publications. The material in the book has been made available to the press.

You Can Help

If you wish to put copies of this valuable pictorial report into the hands of your friends and key people in your community, who otherwise might not see it, you may obtain copies for your own distribution at a rate of $20 per hundred. Write to the Bituminous Coal Institute, 815 Southern Building, Washington 5, D. C.

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SULMET CARBIDE TIPPED COAL-CUTTER BITS

Sulmet Bits are uniform and dependable—the result of expert production by the Carbide Alloys Division of Allegheny Ludlum Steel Corporation, who also collaborated in their development.

5 ways that SULMET BITS can reduce your cutting costs

1. ADDED CUTTING CAPACITY
On the average, 18% of your machine operating time is lost through time out to change ordinary cutter bits. (See table at right.) That's 18% *you save* with SULMET BITS—they have a cutting life many times greater by actual test than the hardest alloy steel bit!

2. FASTER CUTTING
Higher cutting speeds are possible with SULMET BITS because they retain their cutting edge longer. This, plus the fact that these bits will cut many more places without bit-changing, means considerably higher tonnage per shift.

3. LESS POWER CONSUMED
Dull bits require more power to cut through coal. SULMET BITS remain sharp longer . . . hold to the proper bit clearance for most efficient coal cutting machine operations.

4. LESS MACHINE MAINTENANCE
Multishift operation tests a cutting machine's endurance. SULMET BITS cut through hard areas easier, reducing machine maintenance.

5. BEST CUTTING PATTERN
In many cases the use of these bits permits you to use a more favorable cutting pattern in room or entry, because harder areas are cut quicker with SULMET BITS.

FOR LASTING SHARPNESS, GREATER CUTTING CAPACITY, INCREASED TONNAGE PER SHIFT

Carefully maintained records prove the superiority of SULMET BITS

Developed to fit any coal cutter chain using standard 1/2" x 1" bits, these super-hard and rugged tungsten carbide-tipped cutting tools turn in an amazing performance wherever used. Here is a typical case record, in actual mining operation.* Averaging the first and twenty-seventh working places cut with the same set of cutting tools, SULMET BITS not only consumed 30% less power per place, but also cut each place 30% faster than conventional steel bits. This is not exceptional; SULMET BITS give as good or better results consistently.

SULMET BITS are furnished in different carbide hardness grades brazed to a shock-resistant alloy steel shank which has been especially treated to insure great strength. Each is proved to give maximum results under certain seam conditions. For this reason it is important that a Sullivan coal-cutting specialist be consulted in every instance where use of SULMET BITS is being considered—to engineer them to your individual requirements and produce maximum advantage for you. Let us work with you—there's no obligation.

Sullivan Division • JOY MANUFACTURING CO.
General Offices • Henry W. Oliver Building • Pittsburgh, Pa.

* Name of mine and detailed records available on request.

Joy Engineer

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

APRIL, 1947

Ivan A. Given, EDITOR

Still Goal to Go

THE SUPREME COURT decision in the Lewis case brought punishment for contempt of court and gave some government officials an excuse to stick their chests out, but totally failed to settle any of the fundamental problems, let alone the question of whether Lewis can terminate his contract with the government—in case he still wants to. In short, the conditions that led up to strikes, seizure and illegal retention of the bituminous mines of the Nation still exist. The word "illegal" is used advisedly. The plain wording of the Selective Service Act supports that conclusion. In fact, the Federal District Court for the Northern District of West Virginia, in its decision of March 7, declared the seizure of the mine of Ralph A. Fox, by order issued Aug. 5, 1946, nullified the Fifth Amendment of the Constitution, thus further supporting the conclusion that not only was retention of the mines beyond the 60-day limit illegal but also the original seizure.

Action by Congress, as frequently pointed out, is the only solution to the problem of securing a fairer government approach and a better basis for settling questions raised by labor leaders. If government partiality can be eliminated and labor leaders required to really bargain with the interests of the public, as well as the employees and the industry, in mind, many of the difficulties that have resulted in seizure will disappear. Reasonableness and fairness in the approach to the problem of assuring the worker a fair share of industry proceeds would be further simplified and work stoppages with their attendant inconvenience and discomfort materially reduced—if not eliminated completely.

While it appears that Congress is inclined to proceed along lines that experience has proved are the right ones, that does not mean that it necessarily will follow through completely—or that a veto will not be the next step. So, there is no reason to feel that coal, or any other industry, is out of the woods. Proposals for perpetuation of the seizure power and bills to that effect still pop up. And, in addition, while there has been some change in administrative approach, it still is a long way from sufficient. Government officials could very easily drop back to partiality if not headed off by legislation correcting the obvious inequalities of the past and laying the groundwork for reasonableness and fairness in the future, while the Supreme Court, in the absence of any legislative mandate to the contrary, still is inclined to construe things against the employer. In other words, the job is by no means done. Since coal has been the outstanding victim of past policy and practice, it, especially, must keep the pressure on and carry through, not only with Congress but with the public.

Bench Mark

IT IS PERHAPS superfluous to say that the coal industry is relying more and more on the machine as the foundation for a better future. The machine is promoting progress not only in loading and preparation but in such new applications as timbering. When backed up by cooperation between men and management, good engineering and tried and proven operating methods, the benefits of the machine are further enhanced. Getting machines in, setting the stage for good labor relations and taking full advantage of methods that enable men and machines to produce with maximum efficiency therefore become major responsibilities of management, since they provide coal with powerful weapons in its battle with competing fuels and energies.

Men charged with coal-mining managerial responsibility will find at the Cleveland Convention and Exposition of the American Mining Congress not only the latest in machines—and in the materials and supplies that make for low-cost mining—but also data on how this equipment and these materials can be used most effectively. Cleveland in 1947 could be the starting point of a new cycle in progress in coal mining. Certainly, coal men should not overlook the opportunity it affords for a step ahead.

Cutting Cost In Coal Mining

High productivity the key to low prices—coal's biggest competitive weapon. The machine is the No. 1 tool of management and men in attaining this goal. Maximum coordination of the efforts of management, men and machines promotes efficiency and insures a better competitive position through lower cost and prices.

WITH HIGH EFFICIENCY, low cost and quality the critical factors in holding customer goodwill and markets, coal-mine management has at least three major responsibilities:

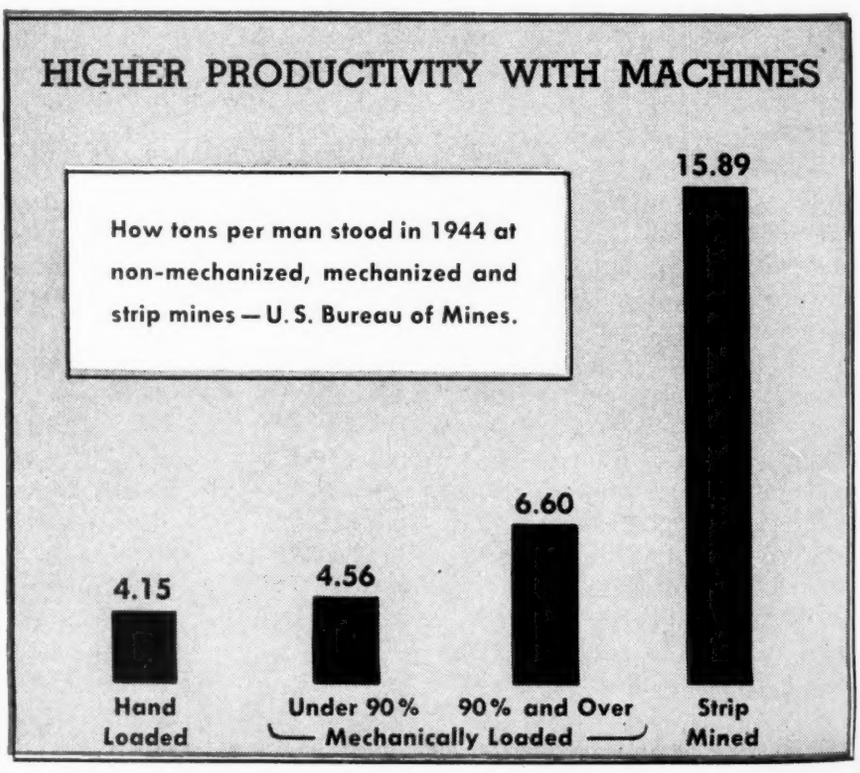
1. Installation of the most modern equipment available for raising productivity.

2. Operation of that equipment to achieve maximum output per man with maximum safety.

3. Installation of the most modern equipment available for quality preparation and its operation for the maximum quality-coal yield consonant with cost.

Modern coal-preparation equipment is accepted not only as the best means of reducing impurity content but, equally or more important, as the way to turn out a uniform product better sized, blended and treated for greater consumer satisfaction. It also can reduce the labor cost of preparation because more operations are performed by machine. In some instances it can reduce total cost. Even when an extra cost is accepted in return for an improved market position, it can be kept down by careful adjustment and automatic operation of equipment; retreatment of certain products, including middlings, and—where desirable—refuse; reclamation of fines from wash water, including use of such new units in coal-preparation practice as flotation machines; and salvage of coal from mine refuse.

While a cost saving may not always be possible with modern preparation — other objective being counted as more important—there is no question about the benefits of modern equipment and methods for mining. The choice available to the operator is increasing constantly. Stripping to supplement deep mining is an example. Where overburden depth and other considerations, including coal quality, permit, the operator can also produce by the opencut method—still



THIRTY FUTURE COST CUTTERS

1. Higher-capacity loading machines for both thick and thin seams.

2. New-type loaders for very thin coal. One new rubber-tired unit already is being installed.

3. Expanded use of combination cutting-and-loading and similar units, some of which are already in service.

4. Expanded use of the coal planer and other slabbing or similar-type machines designed for semi-longwall work.

5. Wider use of special loaders for entry or gangway work where all or much rock must be handled.

6. Expanded application of loading machines served by shuttle cars or conveyors, plus gathering or mother units for raising or lowering the coal to the loading point, in light- to moderate-pitch work.

7. Application of shaking conveyors and duckbills with special drives on heavier pitches.

8. Expanded use of the power duckbill.

9. Perfection and use of all-purpose mining and loading machines (some designs have reached the stage of operating tests).

10. Wider adoption of full-seam mining, including taking drawslate — made possible by modern mechanical-preparation facilities.

11. Increased mechanization of conveyor and other equipment movement by special pullers and carriers for drives, belts and other parts.

12. Wider use of mechanical bugdusters on shortwalls and extension of the field of mounted universal cutters.

13. Increased application of mounted drilling machines with powered head motions, reducing drilling labor one to two men.

14. Longer cutter bars and special-alloy or insert-type cutter and drill bits.

15. Expanded use of timbering machines, which save one to three men per shift.

16. More prefabricated-track layouts for fast car change, supplementing more big mine cars (up to 15 tons and more) and higher-capacity gathering locomotives for mechanical-mining use.

17. Greater use of belts in room entries with conveyors and with shuttle car-loader units.

18. Growing use in main-line service of higher-speed, higher-capacity haulage locomotives and belt conveyors, with the latter leading the list in slope hoisting.

19. Wider employment of portable substations, plus plenty of copper and modern controls for good power and protection at the face.

20. Greater use of gravity by means of ditches, drainways, boreholes and the like in handling water, shortening of pumping distances by vertical holes or auxiliary openings, and larger lines to supplement modern pumping units, controls and materials.

21. Bigger airways, leak-proof stoppings, one-way travel, splitting and special means of ventilating faces to supplement modern fans.

22. Better shops (especially near the working faces), more tools and wider use of special equipment for better maintenance.

23. Continued development and wider use of special equipment for mechanized handling of materials and supplies above and below ground.

24. Increased pressure for safety, accompanied by growing use of permissible equipment; rock-dusting, sprinkling and fire-fighting facilities; improved facilities for men, etc.

25. Higher-capacity stripping shovels with ability to spoil deeper overburden.

26. Increased use of draglines.

27. Higher-capacity drills requiring less labor to operate and providing increased flexibility in placing charges for breaking overburden.

28. Wider use of scrapers, special loaders and other special units in stripping, in increasing production of strip shovels and in loading.

29. Bigger haulage units in both regular and crop strippings.

30. Wider use of mechanical-cleaning equipment and auxiliaries, including a higher degree of mechanization of refuse disposal.

the most efficient of all in mining.

If the cover is too deep, the operator can go underground with a wide variety of modern equipment designed for thick or thin beds, good to bad top and level- to moderate-pitch work. Development work constantly under way promises even better machines with a wider range of applications in the future. These future machines undoubtedly will include continuous mining-and-loading units, partly or completely eliminating face preparation. For that reason, management must keep in mind another real responsibility: replacing existing units with new machines offering further substantial cost reductions as soon as they are available.

Modern equipment and methods get results. Even 2 tons per man-shift is worth a sizable investment in machinery; more so for an increase of over 11 tons. That such increases are possible is proved not

only by achievements at properties studied by *Coal Age* but by industry results compiled by the U. S. Bureau of Mines. A Bureau study, presented in the April, 1946, *Coal Age*, showed the following tons per man-shift in 1944:

Deep mining, 100 percent hand loading	4.15
Deep mining, less than 90 percent mechanically loaded	4.56
Deep mining, 90 percent or more mechanically loaded	6.60
Strip mining	15.89

Installation of machines of itself results in a saving but by no means exhausts the possibilities as the records for constantly climbing tons per man at many mechanized mines show. In groups of identical underground mechanical mines winning *Coal Age* "Coal-for-Victory" awards, for example, increases in tons per man included the following:

Tons per Man	1943	1945
Coal 48 in. thick or over	4.6	5.9
Coal over 48 in. thick	5.4	7.3

What efficiency increases such as these mean can be approximated by dividing various tons-per-man figures into $13.13—what an "average" miner can earn in a nine-hour day, based on the average bituminous hourly rate of $1.459 as reported for October, 1946, by the Bureau of Labor Statistics. On this basis, relative labor costs are:

Tons Per Man-Shift	Labor Cost per Ton
3	$4.38
4	3.28
5	2.63
6	2.19
7	1.88
8	1.64
9	1.46
10	1.31

Where reductions result from the purchase of additional equipment—the most effective means—the savings may be decreased by depreciation of the extra investment, extra maintenance, possible extra power (not always the case), a higher fine-coal percentage and other charges. However, savings in other directions (greater safety, concentration, better management and so on) tend to offset these deductions. Even if the deductions are not all offset, the net is substantial, and it is achieved by getting more out of an existing installation without further expenditure, that net is correspondingly greater.

A start can be made toward the desired goal by applying proper principles in hand loading. But the machine remains the real answer to the problem of achieving higher efficiency, lower cost, higher quality, easier work and good wages. Present types have proved their ability to provide these and other advantages. New and improved units will offer additional advantages in the future.

Cost-Cutting Methods

EQUIPMENT IS, in the long run, only a part, although an important one, of the over-all problem of increasing productive efficiency. Men and methods are the others—skilled men who understand their jobs, know what efficiency means in terms of industry and company progress, as well as in terms of a living for themselves, and are genuinely interested in achieving high productivity, and methods that enable the men and the machines to perform according to their abilities.

Achieving the desired manpower goal, as with practically everything else, starts at the top and works down through intermediate management to the mine worker. Top management, therefore, concerns itself more and more with achieving its own understanding of good employee relations and with putting them into practice. That includes not only sharing the facts with employees and making it easier for them to cooperate but also keeping supervisors posted, enlisting their interest in promoting good relations and making it possible for them to acquire greater skill in this department, since they are key factors in fostering the community spirit that is one of the foundations of higher efficiency.

The list of things, besides supervisors who know their job and top management that works to bring home to employees the fundamental fact that they are a part of a team that succeeds better when all pull together, is a long one. Some points, however, are: expansion of the program of sharing the facts to take in the miners' families and the people in the neighborhood who are not directly involved in mining—in other words, good public relations; proper induction and training of new men; provisions for older men who so desire to join with the younger in acquiring the knowledge and skill that will put them in line for better jobs; good community facilities where the operator is responsible; and working conditions as safe as it is possible to make them.

When the groundwork is laid for good relations, a little incentive enhances the results. Some form of a new incentive wage is a logical development in future coal mining, although working it out will require solving a number of not-too-easy problems. In addition, there is good reason to defer attempts at wide-scale application until management has exhausted other means of promoting efficiency—something it has not yet done in spite of a great deal of effective work. But there are other incentives equally effective when properly applied. They include:

1. The prospect of increased earnings through the better working time normally available to the efficient mine with a low cost.

2. The competitive spirit — in other words, the normal human urge to be as good or better than the next one. Competition between crews and between shifts is enjoyed by men and gets results.

3. The desire for recognition, meaning a good word, a pat on the back, piece on the bulletin board or an item in the paper, for a job well done. Recognition of achievement is a fundamental plank in cost-cutting programs at many mines.

Statistically and otherwise, recent developments provide additional evidence that the ground is fertile and that cultivation gets re-

sults. The *Coal Age* miner-opinion survey of last December, for example, showed, among other things, that the majority of the miners (79 percent) think their companies and managements are pretty good. Thus, top management and supervisors have much in their favor when they start out to build good relations and cooperation through sharing the facts. That it works is proved by experience at many mines, including one where a large share of the credit for a rise of from 5 to 8 tons per man in three years was given to converting a mine force from an aggregation of chip-on-the-shoulder artists to men interested and willing to help management do a job.

Groundwork for Efficiency

IN THE MINING OF COAL, the natural conditions encountered impose certain limitations on both men and equipment. They also impose certain limitations on the mining plan. But these limitations can be eased and cost cut by proper choice of a mining system. Not only does the way in which a given coal area is attacked affect the performance of production units and the charges for non-productive work, such as moving equipment, it also affects the expenditures for power, air, drainage, haulage and so on.

Aside from these considerations, modern producing equipment and the fact that obsolescence is higher is resulting in a change in over-all mine planning. Since belt slopes and other modern methods of cutting the cost of opening a mine make it cheaper to get started, since increasing distance involves certain costs that increase more than in proportion and since obsolescence is a bigger factor, many operators are planning mines with lives as short as ten years. At the end of that period, new machinery is bought as necessary and a new start is made in a new tract of coal with the advantage of all the techniques developed in the intervening period.

Where the latter practice is not possible or other factors make a longer life desirable, greater thought is being given to haulage that will remain low in cost even over great distances and to successive moves of fans, power stations, drainage openings, man-and-material portals, service facilities (shops, warehouses, bath houses and so on) at carefully scheduled intervals. Thus, except for haulage, distances are held within economical limits and costs consequently kept low.

Within the limitations always present, deep-mining plans can be adjusted in several important cost-reducing respects other than those previously mentioned:

1. Retreat work — preferably over the entire mine and certainly within areas or sections. Troubles are left behind and as distances get shorter costs come down.

2. Provision for ample airways and for openings to promote one-way travel. Savings in power over the mine represent big money.

3. Provision for gravity drainage and for pumping the shortest possible distance—vertically when necessary. Power savings again are substantial.

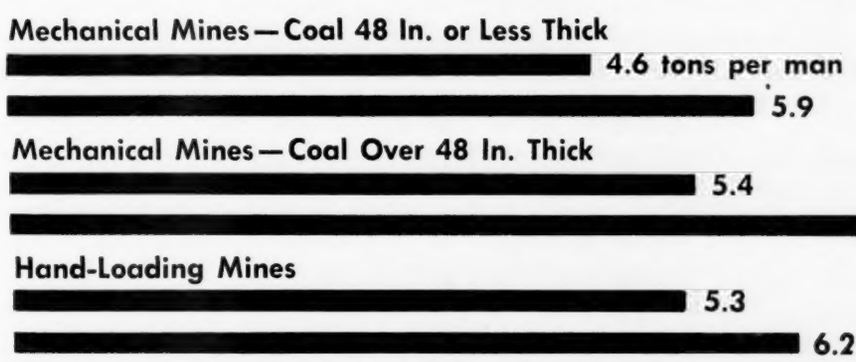
4. Shortest possible haulage routes with grades in favor of the coal—purposely made so by taking top and bottom if necessary—whether cars or belts are used.

5. Concentration of operations —saves in practically every direction. In addition to keeping working territories to a minimum consonant with enough places per machine, concentration, when accompanied by multiple shifting, saves through reducing equipment investment per ton of production, although the savings are partially offset by shift differentials and certain other charges.

6. Providing adequate territories for mechanical-loading units. While some operators have success-

Better Methods — Higher Efficiency

How certain identical mines, over a three-year period, increased tons per man by better application of fundamental principles



COST CUTTING AT THE FACE

1. Retreat operation.
2. Concentration of workings.
3. Maximum coal recovery, thereby reducing per-ton cost of moving units between sections.
4. Territories providing sufficient coal for high-volume high-efficiency production.
5. Maximum tons per fall by widening places (where possible), and deepening cuts.
6. Drilling patterns and shooting practices providing easily loaded falls.
7. Power cutting and disposal of partings or full-seam mining, including taking drawslate.
8. Track layouts automatically assuring a short car change or an uninterrupted supply of cars at the conveyor-loading point.
9. Overhauling of cycles in other directions to eliminate timbering and other bottlenecks.
10. Coordination of crew size with mining plan and equipment.
11. Synchronization of activities beyond the territories to insure good service to workings.
12. Coordination of capacity of auxiliary equipment to that of the loader, including installation of higher-capacity units, if necessary.
13. Machine timbering.
14. Mounted drills with power positioning of spindles.
15. Power bugdusting.
16. Longer cutter bars with modern high-capacity bits.
17. High-capacity higher-efficiency transportation equipment — big cars, rubber-tired haulage, conveyors, etc.
18. Steel-tie track, including prefabricated turnouts and complete prefabricated section-track layouts.
19. Special equipment for moving mechanical-mining units (pullers, belt reels, carriers and the like).
20. Constant study of operations to break bottlenecks and discover where new methods and equipment can promote efficiency.

fully achieved high tons per man with only two places, although this requires the closest of coordination, more places rather than less, within reasonable limits, tends to increase output per unit and thus raise tons per man by reducing interference.

7. Making place width as great as possible consonant with safety and cost of roof support, thus reducing time lost in moving equipment from place to place or stopping to begin a new cycle in conveyor faces.

8. Increasing size of territories, especially where mother belts are employed, to reduce cost of moving equipment. Savings of 2 to 5c, per ton have been reported as a result of relatively small increases in territory size. The same effect results, of course, where the percentage of extraction is increased.

Helping Machines Produce

INSTALLATION of mechanical-mining equipment of itself results in an increase in productivity per man but that is not the whole story. Improperly operated or badly serviced, it will not yield maximum benefits. After the equipment is purchased and the best possible mining plan chosen, getting maximum results is up to the mine management. In addition to doing its share in maintaining a good working force and promoting good relations with employees, mine management has at least four other very major responsibilities.

1. Keeping the equipment and the mine in shape to produce without interruptions.

2. Making sure that materials and supplies are on hand in the necessary quantities at the places and times they are needed.

3. Checking, with the engineering staff, on where auxiliary equipment, such as tool trucks, grease trucks, supply carriers, timbering machines and the like, will add to efficiency and recommending their purchase to top management.

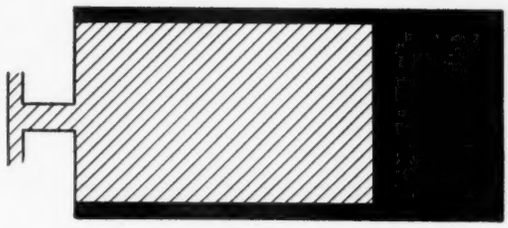
4. Doing the things that logically should be done to enable the key machine—the loader (or hand loaders into cars or onto conveyors)—to work at as near capacity as possible.

Failure to appreciate the fact that the loader in a deep mine, like the stripper in an opencut operation, cannot of itself compensate for bottlenecks elsewhere is one of the more common reasons why units fall short in tons per machine and per man. All too often, in spite of long experience, the tendency is to fuss over the loader itself whereas, except for maintenance, the things that really deserve attention are the auxiliary units and activities.

In view of this key principle in loading, which applies equally to hand loading within the limits of fatigue, it seems logical that mine management's first job is hunting out and breaking bottlenecks. Assuming that the loader is standing idle or has unused capacity, quite frequently the case, the thing to do is to look around and find out what other machine, or other crew (track, timber, etc.), is sweating ahead under maximum draft while everything else loafs along or waits.

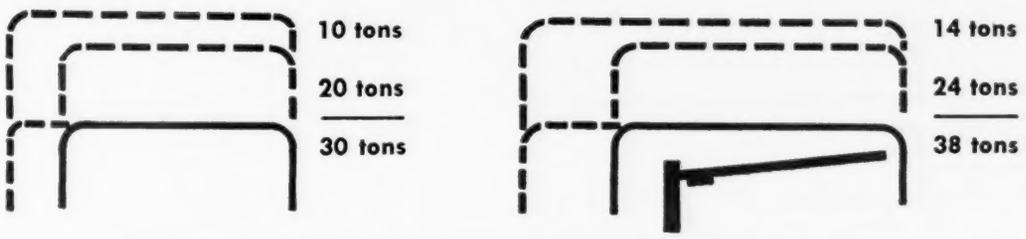
Anyone can use this method of determining where bottlenecks exist as a prelude to taking the

Major Steps to Higher Efficiency

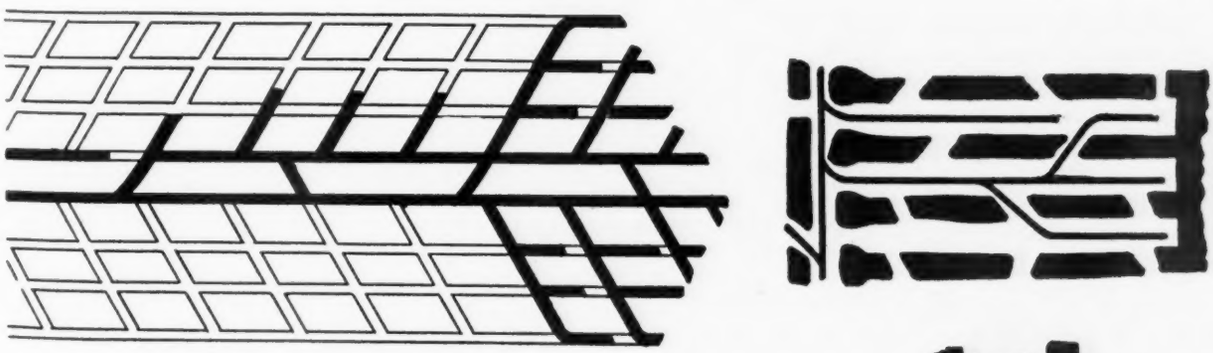


More coal per territory—
reduces moving cost in
trackless mining

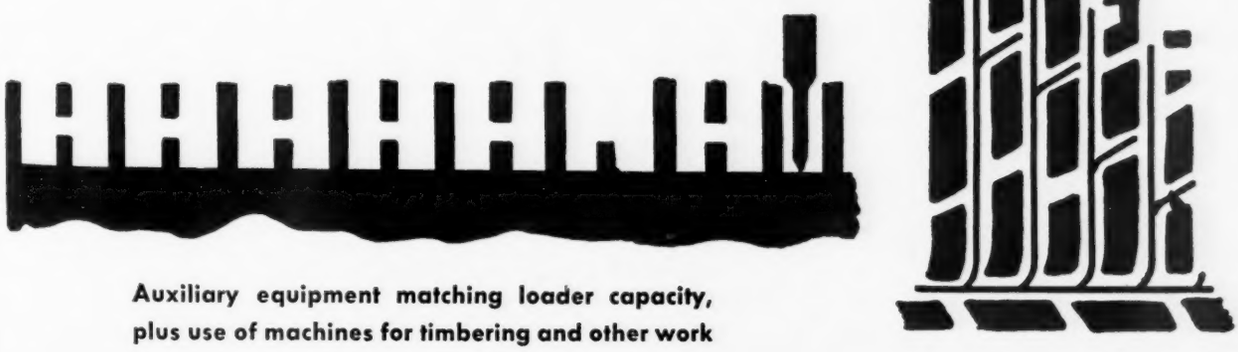
Ample working places for high unit
and per-man output



Wider places and deeper cuts—reduce loader moving time and
dead work in starting new conveyor cycles



Short car change plus big cars



Auxiliary equipment matching loader capacity,
plus use of machines for timbering and other work

EFFICIENT STRIPPING

Higher efficiency in stripping, as in deep mining, involves doing the things that should be done, including the purchase of equipment when it will increase output and tons per man or enhance recovery by making it possible to work deeper overburden. Some of the accepted steps are:

1. Bigger dippers on old and new shovels. In one recent instance, a 35-yd. unit was replaced by a 40.

2. Longer booms and sticks for wider pits and operation in deeper burden.

3. Installation of modern electrical controls for faster operation — up to 10 percent or more.

4. Draglines, particularly of the walking type, for the entire stripping job in deeper overburden.

5. Scrapers for stripping and for box-cutting, ditching, knocking off high spots, cleaning up slides and other miscellaneous pit services, reducing shovel interruptions and enabling stripping to proceed more efficiently.

6. Tractors and bulldozers for clean-up and miscellaneous work, relieving the strippers.

7. Tandem operation of shovels, particularly in outcrop stripping; one advantage is an increase in pit width.

8. Some spoil rehandling with draglines to enable them to work deeper burden, including ramping across the pit at intervals (December, 1946, *Coal Age*, p. 92).

9. Use of rehandling units (bulldozers, scrapers, small draglines etc.) to permit operation through high spots.

10. Adoption of underground mechanical mining to supplement stripping when overburden thickness begins to crowd stripping units or becomes excessive.

11. More study of overburden shooting, resulting in greater use of horizontal holes on two levels; splitting of charges in vertical as well as horizontal holes for better breakage of the material; large holes with heavier charges, permitting hole spacing to be increased, etc.

12. Improved drilling equipment, including rotary- and auger-type vertical units, for larger holes and for conserving manpower not only by faster drilling and fewer holes but by applying power to all operations.

13. Special alloy and insert-type bits for longer tip life, faster drilling and reduced power consumption.

14. Improved mediums for shooting overburden for better fragmentation at lower cost, accompanied by increased use of combinations (such as gelatin and free-flowing) for better results under certain conditions.

necessary steps to increase efficiency. A more precise method is the time study.

By finding and breaking bottlenecks one after the other, it is conceivable that a point finally is reached where the loading itself is the limiting factor. Then is the time, perhaps, to start a new cycle by going to a loader with a higher capacity, or, if hand loading either into cars or onto conveyors is the practice, changing to mechanical loading unless — an exceptional situation—natural conditions forbid.

Bottlenecks can exist other than in equipment, track layout or other respects. Manning of units is an example. The rule is that if adding a man increases the unit tonnage enough so that there is an increase in output per man—for example, from 20 to 21 tons—that addition is a good investment. When a point is reached, however, where putting on another man reduces the average individual output, then the limit has been attained, barring a change in the mining plan or the type of equipment used.

Coordination of crew size with the working layout and the equipment used for production is not an unduly difficult problem, while its solution is one step toward attainment of maximum efficiency and minimum cost. Then, when all the things are done that should be done to eliminate bottlenecks, it becomes time to consider what more can be achieved by expanded use of power and equipment. Greater and more effective use of machinery in auxiliary operations is a new trend in coal mining that is becoming rapidly stronger, since it represents a new opportunity for substantial savings.

If the loader is not able to work at closer to its rated capacity because other equipment or activities are not matched, mine management should not hesitate to recommend changes in existing machines and the purchase of new to raise unit and individual output. In fact, top management should expect such recommendations. An obvious one, as an example, is longer cutter bars, although they are not suitable in some exceptional cases. The reason is that the more coal in one place or fall, the less frequently the loader has to lose time in moving and the less often deadwork has to be repeated to start a new conveyor-mining cycle. Modern bits, which greatly reduce bit-changing time in addition to other advantages, are another equally obvious recommendation. So are bigger mine cars, adequate sidetrack facilities with hoists or barneys for facilitating service to conveyors, particularly mother-belt units, etc. All these reduce non-productive time and consequently cut cost.

More and more attention, as previously noted, is being given to reducing the hand work and physical effort in various mining operations. Jacks to speed up temporary timbering and make it easier and safer are an example. Power equipment for bugdusting is another, also facilitating increases in cutter capacity. Recently, also, application of power to the positioning of spindles on mounted drills is making real savings by reducing size of drilling crews one man or more.

When, as at one operation, power positioning was supplemented by machine timbering, reducing crew size from 17 to 14 men while unit tonnage increased, was perfectly feasible.

Thus, the machine is widening management's opportunity for increasing efficiency and cutting cost, thereby supplying the foundation for good wages while giving the consumer a break in price. When it is backed up by good labor relations, a well-thought-out mining plan and—of critical importance—doing the things that logically should be done, the stage is set for a close approach to the ideal.

Service for Efficiency

WHILE WORK AT THE FACE naturally is the subject of the most concentrated attention because there is where the most money is spent, application of fundamental principles to various service operations is a fruitful field for cost-cutting in both deep and strip mining. These operations include haulage, power, ventilation, pumping and drainage, maintenance, distribution of supplies and safety. The savings are achieved in two general directions:

1. Reduced cost of the operation itself.
2. A further saving at the face through the effect of better service on face productivity.

In these departments, also, achieving maximum results is a combination of: (1) expenditures for equipment that will conserve power and labor and (2) conforming to accepted fundamentals in operation—in other words, doing the things that logically should be done.

Haulage

For efficient haulage that also promotes efficiency at the face in deep mining, top management discharges much of its responsibility when it authorizes the investment necessary for results. Then, it is largely up to mine management to carry on in reducing haulage distances, cutting down grades, installing supports for roof and ribs that will last the life of the opening with a minimum of attention, specifying treated ties and heavy rail, using better track joints, draining the roadways and constructing the track to modern standards. All these are factors in roadways providing trouble-free low-cost haulage over the years. With grade reduction and keeping distances at a minimum, this frequently makes possible a cut in the number of locomotives and crews required for a given tonnage. Cost also is lower because less manpower is required to maintain and replace such items as ties, timbers, etc., power consumption is reduced, there is less wear and tear on equipment, derailments are reduced and so on.

Since some authorities consider it now profitable to spend as much as $25,000 or more to save the labor of one man, it can be seen that rather heavy investments are warranted to conserve on manpower and still come out with a cost reduction. Thus, outlays for such things as additional passing tracks, a dispatching system, block signals, electric switchthrowers and higher-speed higher-capacity locomotives that reduce the number of units necessary for a given output may quite logically be recommended and approved, along with others for such things as automatic instead of manual shaft bottoms, skips instead of cages, belt slopes instead of shafts where cover thickness permits and other similar cost cutters.

Power

With the growth of mechanical mining, good power has of necessity become an increasingly important consideration. Bad power slows down machine operation and results in more breakdowns, running up the cost not only because

Good Haulage—Higher Efficiency—Lower Cost

1. Shorter hauls.
2. Grade reduction.
3. Permanent roof support.
4. Treated ties and timbers.
5. Good track joints.
6. Heavy rail and good construction.
7. Good passing facilities.
8. Dispatching.
9. Block signals.
10. Electric switchthrowers.
11. Automatic doors and overcasts.
12. High-speed high-capacity locomotives.
13. Automatic shaft bottoms.
14. Skips.
15. Belt slopes.
16. Proper installation and protection of belts; proper equipment for feeding belts and surge facilities.

BETTER STRIP SERVICE

1. Bigger trucks and trailers — save manpower.
2. Better roads (1- to 1½-percent grades, ample width, good drainage, good materials and construction and dustproof and waterproof running surfaces) — increase haulage capacity 10 percent or more.
3. Better engines (diesel, butane, etc.) — higher average speed and higher capacity.
4. Better road maintenance through special patrols, oiling and sprinkling trucks and so on.
5. Combination truck and rail haulage, including use of deep-mine tracks as well as railroad sidings, where available, to cut down truck hauls.
6. Ditches on the highwall, together with dams — with or without automatic pumps — and other facilities to keep pits dry.
7. Increased self-draining of pits by ditches and pipes or culverts through spoil banks.
8. Automatic or semi-automatic pumps with weatherproof electrical equipment for pit and other service.
9. Unit substations complete with auxiliary equipment — more efficient and easier to keep close to work.
10. Capacitors and other protective equipment for better power-factor and stable voltage.
11. Better lightning protection.
12. Ground-protection facilities for safety.
13. Cable-handling facilities that conserve manpower and improve service to equipment.
14. Improved switch houses and junction boxes.
15. Bigger and better shops and shop facilities.
16. Regular inspection and good records of equipment condition, repairs, and delays and their causes.
17. Mobile field-repair units.
18. New metals and insulating materials for reduced weight, longer life and fewer failures.
19. Good lubricants and methods, including lubricating trucks.
20. Good tire service and maintenance, including tire-service and repair trucks for field use.
21. Ample supplies, good warehousing and parts as necessary in the field and on equipment.
22. Special winches, winch trucks, stationary and mobile cranes and trucks for handling heavy parts and materials and facilitating field repairs.
23. Welding and repair trucks.
24. Fuel trucks and other special trucks for servicing in the field, thus keeping equipment on the job

the machines produce at a lower rate, are out of service oftener and use up more parts and labor in keeping them going but because sluggish operation and stoppages have a psychological effect on men. In short, men are not inclined to put forth their best efforts when power is bad.

Low voltage is not hard to detect. Getting it up is largely a matter of doing what should be done. Where additional substation capacity (a.c. or d.c.) is necessary, it naturally should be installed. The trouble, however, usually is elsewhere and practically always responds to standard remedies. These include: keeping substations close (making them portable saves moving labor as well as reducing the quantity of copper that otherwise must be employed in trying to maintain voltage), adequate trolley and feeder capacity, a good return.

Since they eliminate the necessity for paying for something that cannot be used, capacitors, supplementing synchronous motors, usually save their cost in a year or two by correcting power-factor. Improved lightning protection naturally is installed because it reduces production interruptions in addition to decreasing the possibility of equipment damage.

Ventilation

Over the life of a mine, a moderate air loss otherwise preventable runs into a great many thousands of dollars, a loss that is enhanced by inefficient fan equipment, unnecessarily high pressures and velocities, failure to take advantage of splitting, returning air all the way to the point of intake and so on.

Some idea of the effects of leakage can be derived from considering relative losses through concrete-block and rough-board stoppings. For the concrete-block type, some authorities put the loss per stopping at 6 c.f.m., or 600 c.f.m. for 100. The loss with the rough-board type is 340 c.f.m. each or 34,000 c.f.m for 100.

Along with modern fans, which normally cut power costs one-third to one-half and occasionally as much as 80 percent, other potent cost-reducers in ventilation include: ample airways kept as clean, free of obstruction and as straight and smooth as possible to reduce velocity and turbulence, one-way travel by means of auxiliary openings, and the use of splits where practicable. All these and other steps substantially reduce power requirements, while building stoppings of permanent materials and using overcasts saves labor and other costs for maintenance and more-frequent replacement. Now, recoverable tongue-and-groove blocks are among the things making it easier to install and move temporary stoppings and reduce leakage.

Pumping and Drainage

Water is not something that always has to be handled, since it is logical to conclude that part of the problem can be solved by the simple process of keeping it out of the workings. True, this may involve some expense for ditching around surface breaks, fluming over them, diverting streams or

sealing their beds, grouting from the inside and so on, but that expense normally is much less than the cost of equipment, power and labor for pumping over a period of years.

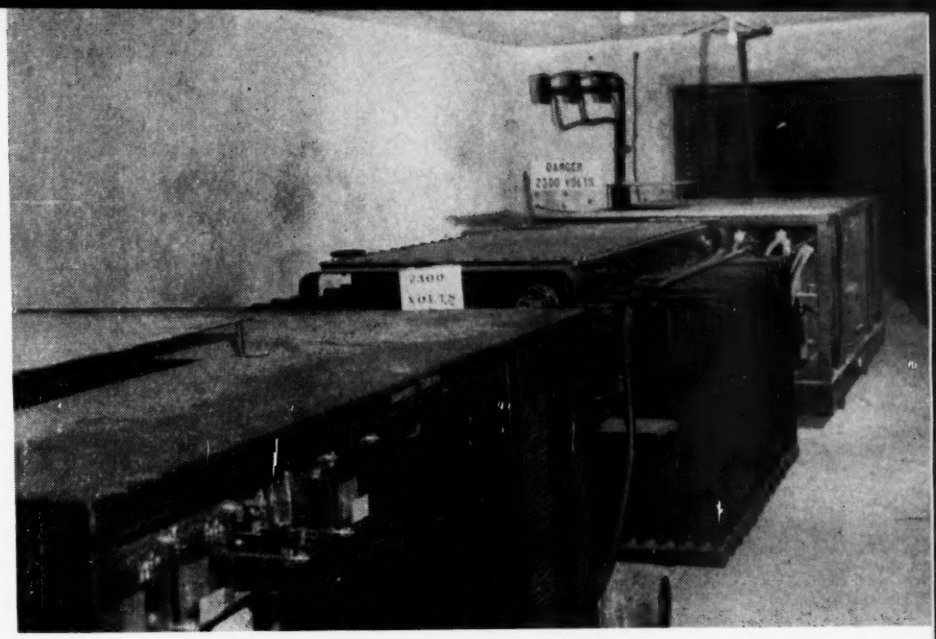
When water has to be handled, as is frequently the case, the logical thing to do is to call on gravity. Thus, more and more mines are turning to drainage ditches, headings and tunnels, boreholes through pillars and to the outside and similar measures to eliminate pumps, power and labor. Where pumping is necessary, there also are lower-cost ways of doing it, including large sumps to hold inflow for pumping at off-peak periods by a few large rather than many small units, large lines to save power, boreholes to reduce distance and also save power, automatic controls to save labor, and corrosion- and abrasion-resisting materials to cut repair and replacement costs.

Maintenance

Again applying the principle of doing the things that should be done, machine breakdowns should be kept to a minimum not only because they involve repair expense but because they stop production. Keeping machines operating continuously should be the prime goal of maintenance. The second is accomplishing repairs and necessary overhauls with a minimum of time and labor.

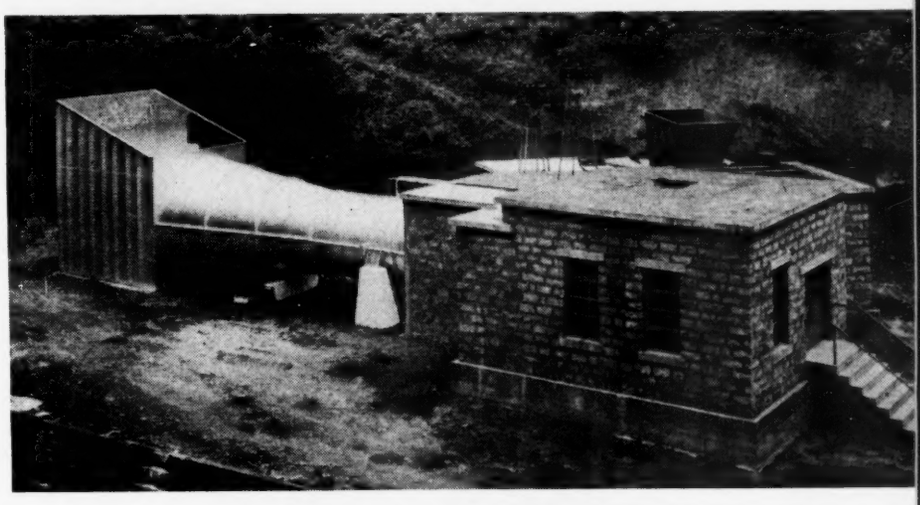
With the first goal in mind, good inspection at regular intervals, good lubrication and regular overhauling of machines or subassemblies become the important considerations. In lubrication, the greasing truck is a growing method of getting the job done correctly with a minimum of labor, fewer production interruptions and economy in lubricant handling and use. Recently, a number of loading and other machines have been fitted with centralized lubricating systems, with, it is reported, excellent results.

Better materials also are doing their share in preventing machine breakdowns. However, the day when breakdowns can be completely eliminated is yet to come and therefore the second goal in maintenance is getting the machine back into service as quickly as possible. Appreciation of the importance of this principle is responsible for the growing use of welding, tool and repair trucks that may be taken to the machine and for the increasing number of shops being constructed underground close to the working sections, thus facilitating not only repairs at the face but also getting the machines back to their territories when the repair is such that shop attention is necessary. Increased labor-saving facilities in shops (hoists, trucks, etc.) are saving money in that direction also.



Power for Efficiency

1. Ample substation capacity.
2. Portable substation equipment.
3. Substations close to work.
4. Ample feeder capacity.
5. Good returns.
6. Load distributors.
7. Central metering.
8. Good lightning protection and grounding.
9. Ground-detecting equipment.
10. Power-factor correction.
11. Automatic controls.
12. Sectionalizing.

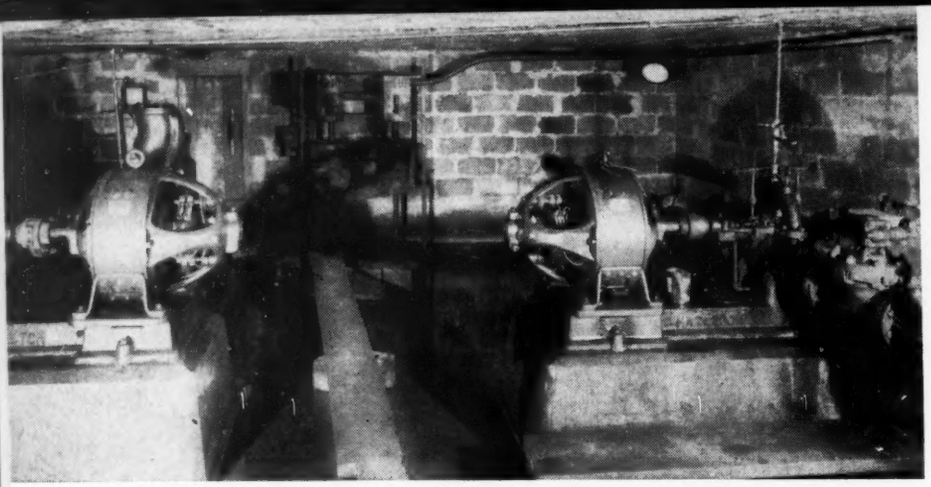


Air at Lower Cost

1. Modern fans.
2. One-way air travel.
3. Ample airways in good conditions.
4. Leakproof stoppings, overcasts.
5. Splitting.
6. Positive methods of getting air to the face.

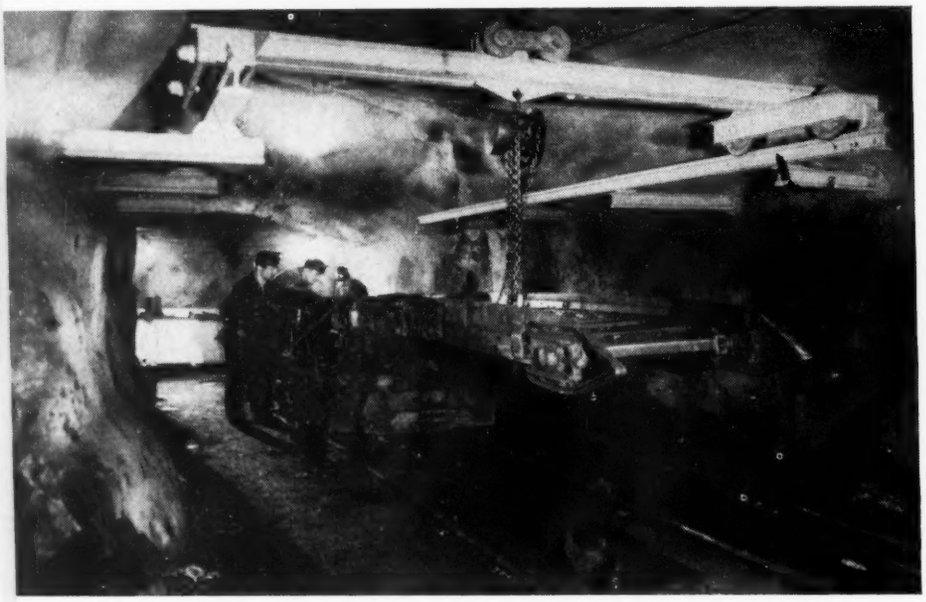
Supplies

Direct expenditures for supplies and materials and their handling are a substantial item in coal-producing cost. Some other costs for which they are responsible are not charged to supplies and supply handling, although, as an example, a shortage of timbers at a par-



Handling Water Economically

1. Preventing entrance into the mine.
2. Handling by gravity underground.
3. Concentration into large sumps and pumping off-peak.
4. Modern pumping equipment.
5. Automatic controls.
6. Large pipe lines.
7. Boreholes to cut pumping distance.
8. Corrosion- and abrasion-resisting materials for longer life and lower maintenance.



Maintenance for Efficiency

1. Regular inspection, good reports, good records.
2. Good lubrication.
3. Regular overhauling.
4. Better materials.
5. Welding, tool and repair trucks to facilitate face repairs.
6. Better shops and shop facilities.
7. Auxiliary shops near workings.
8. Trained men.
9. Careful checks on face preparation and mining conditions.
10. Supervisors and operators with an understanding of maintenance.

ticular spot at a particular time can result in a substantial loss in tonnage unless extra hazards are risked.

Machines are most particularly vulnerable to difficulty in getting parts for replacement. Consequently, a number of supply houses have been moved underground, auxiliary depots have been set up at underground shops and small stocks are kept in the working sections in line with the principle that the loader is the critical machine and must be kept going as much of the time as possible. Therefore, commonly used parts that can be installed in the place should be at hand to reduce the time a unit is down. An adequate supply of timber, rail and other material is equally essential for maximum productive efficiency.

To conserve manpower and reduce cost in receiving, storing and delivering materials and supplies, hoists, cranes, trucks, special car- and truck-height platforms and other labor-saving facilities are going into service more and more in supply yards. To speed up delivery to working sections, specialized cars and trucks are being increasingly employed, including, at one operation, a car designed for spreading gravel for ballasting track. Since dragging, say, a crossbar 300 ft. into a room in trackless mining obviously is expensive, operators are turning more and more to small hoists, especially in pitching coal, and to crawler and rubber-tired supply carriers.

Another way of saving money on supplies that is getting more attention is increasing the recovery of such things as timbers. In addition to the old-time standard methods, equipment now available for timber, bar and rail recovery includes track-mounted recovery units with hoists for the actual pulling.

Safety

Safety, like all other mining activities, is a matter for both top and mine management, as well as a matter of doing the things that logically should be done. Maximum results normally are obtained when top management gets behind the idea and authorizes the necessary expenditures and when mine management exerts itself to put logical safety principles into practice.

Logic also indicates that the worker himself must accept his share of the responsibility for promoting safety, although it is equally logical for management to encourage him in that direction, not to mention Federal, State and union officials. Greater participation by the miners themselves in safety work is the next big step. The sooner it is taken, along with maintaining the pressure on other measures, the sooner the trend toward fewer injuries and fatalities will pick up even more momentum. Fewer injuries of course mean less suffering for men and their families, a lower compensation cost, fewer production stoppages and less damage to the mine and to equipment.

LOCOMOTIVE FUEL:
Job for Both Railroads and Operators

"Interdependence" Not Enough to Protect Stake of Both Carriers and Operators—Until Gas Turbine Is Available, Better Coal and Fair Break for Steam Equipment Will Promote Interests of Both

By R. L. IRELAND
President, The Hanna Coal Co., Cleveland, Ohio

HOW can coal producers maintain their product as the predominant railroad fuel and what should the railroads do to protect their big stake in coal traffic? Their mutual self-interest reminds one of Benjamin Franklin's advice to compatriots of the American Revolution in their competitive problem against King George of England: "If we don't hang together, we'll hang separately."

Each must rejuvenate its thinking and service to the other. The 20 percent of the nation's carloadings which coal supplies must be retained by the carriers, and obviously we coal producers vitally need the 20 percent of the coal market which locomotive fuel represents. Over all, the railroads take 23 percent of the coal consumed in this country. To continue to take for granted the "interdependency" of railroads and coal without progressive action during changing times invites irreparable harm to coal's competitive status.

The glamorized diesel-electric has stolen the spotlight of public interest while the plodding "iron horse" burning coal is treated like a frumpy wife. Railroad maintenance shops groom the gaily painted diesel as a thoroughbred while the steam locomotive is treated like a plow-horse. Colorful magazine advertisements flaunt the diesel's stream-lined "chic," its smoothness and de luxe appeal. Apparently this influences high purchasing policy on motive power.

We anticipate that the revolutionary gas turbine burning powdered coal can defy the competition, yet it cannot really prove itself *in numbers* for several years to come.

R. L. IRELAND

The newest models of coal-fired steam locomotives perform excellently and economically. However, most of the 34,000 steam locomotives in service today were built years ago and so are obsolete. Yet, if properly fueled and given comparable servicing, they run efficiently. But obsolete engines burning ill-suited coals represent a losing combination in this race of locomotive engineering.

Coal producers should change their merchandising attitude toward the locomotive fuel market. Serve the railroads with quality-size blends that render the steam locomotive most efficient and economical. This means improved preparation procedure and upgrading in quality, on a uniformity basis, specifically for railroad fuel.

Locomotive fuel should be in three categories:

The prime should be for long-distance trunk-line freight and de luxe passenger trains where the flamboyant diesel competition is foremost.

The intermediate railroad grade would serve ordinary freight and passenger engines.

A third and lesser grade would suffice for local short-haul freight, switching and such.

Availability is the key to the steam locomotive's competitive struggle against the diesel. By availability, or *readiness in use*, I mean the percentage of total time that a locomotive is available for traveling the tracks. Availability is not to be confused with *usability*, which is the percentage of time actually in use.

Serving quality grades of coal obviously affects the sustained-speed basis on long hauls, which is today so important in fast-freight and passenger service where the diesel rivalry is so strong. As conditions are today, the flexible steam locomotive is kept, to a great extent, on a less favorable standby basis for accommodating swings in traffic demands.

The most modern steam locomotives, fed suitable coal, can have an equal *availability* with the "prima-donna" high-cost diesel when given equal servicing attention in railway shops. Reliability also is enhanced when only those coals suitable for efficient operation are burned. Even the most competent fireman cannot get the best out of a locomotive when coals of variable qualities and sizes are used. The steam locomotive is a mobile power plant with critical limitations in size, weight, grate area, furnace and ash-pan volume, drafting and steaming capacity. Obviously it cannot perform at its best on a sustained speed-distance basis if just any or every size and quality of coal is shoveled into its gullet. I repeat that the combination of obsolete engines and improper coal grades is not a winning one.

This is a critical period for acting. The extraordinary wartime in-

Quality coal, also involving better preparation, should be the contribution of the operator to a solution of the locomotive-fuel problem and diesel competition.

dustrial activity and traffic is behind and this new year of 1947 poses serious problems of high labor costs and prices as general business activity adjusts to peacetime and, we hope, a normal basis. Considering the railroad earnings outlook at this time, it is in point to say that the carriers retain an enormous investment in their existing steam motive power. It behooves prudent management not to "go overboard" on buying new diesels in this critical transition period, when the gas turbine appears to be in the offing and the 34,000 existing steam locomotives can render good service. Moreover, the most modern types of steam locomotives are very efficient.

The *availability* factor on the 34,000 steam locomotives, therefore, should be maintained as high as possible. Coal producers should be insistent that existing steam motive power gets only those coals which result in the highest efficiency.

Merchandising selected qualities and sizings has long been done in such consumer-minded industries as coffee, cigarette tobacco, whiskey, prepared meats and many another familiar product. There is nothing new in blending to suit particular markets. It can be done with coal. Of course, I am over-simplifying the task, but we must cater to this great bulk consumer by giving the steam locomotive exactly those coals it requires to out-perform its rival. Many companies are spending great sums of money with this broad scheme uppermost in their thinking in the future.

Too often in the past, coal mines have sold the carriers coal that ill-suited their needs. With the excuse of keeping revenue traffic moving, surplus miscellaneous sizes have been foisted on railroad purchasing agents. There was a time when this was "fair enough," but today this practice is tantamount to feeding the steam locomotive like a plow-horse at a critical time when the gaily-groomed diesel, like "Mrs. Astor's pet horse," comes prancing into the spotlight and draws the applause from the gallery.

Persevering research is another aspect. The modern version of the overfire steam-air jet is praiseworthy yet incidental to the entire picture of improving coal technology. Bituminous Coal Research, Inc., needs all the support we can give it. The locomotive gas turbine, fired by powdered coal, is hopefully significant, but not yet here.

Much can be done by the railroads. They can reform, renovate or update their roundhouse and mechanical shop practices. The old-fashioned roundhouse, comparable with the old-fashioned blacksmith shop, can be revamped into a modern, quick-service railroad "garage." Steam locomotives can and should be repaired in a matter of hours and sped on their way, whereas it has taken days. "Availability" of the diesel is little better—and on the basis of capital cost not as good —as that of the steam locomotive when the latter is given comparable, alert attention in the mechanical shops.

The diesel merchandisers got off to a fast start by emphasizing the need for special machinery and special maintenance facilities for attending the high-investment-cost "prima donna." The diesel *must* have prompt servicing to keep it moving to pay off economically. The tempo of this discriminates against the more flexible coal-fired steam engine.

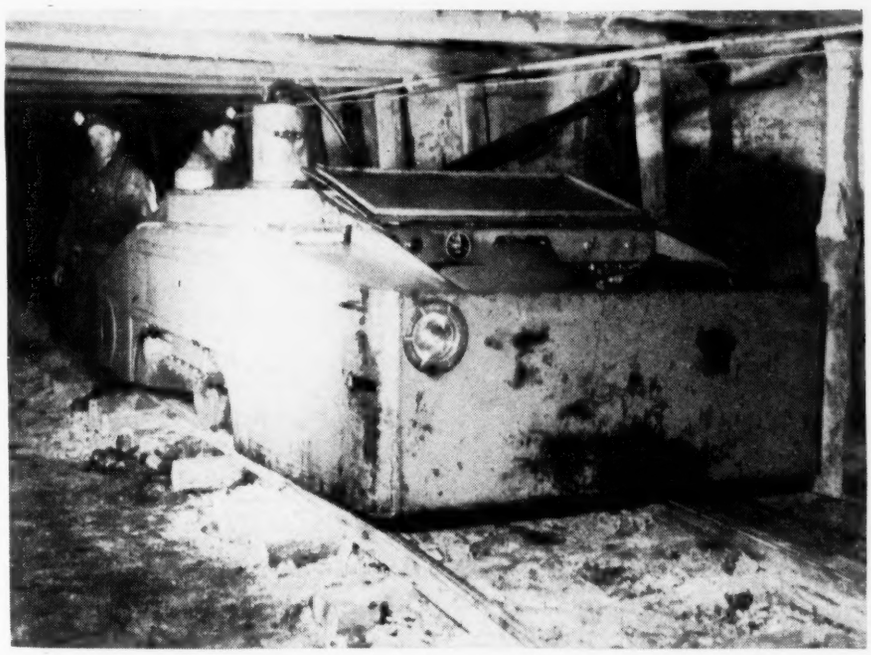
I contend that the newest types of steam locomotives are at least the equal, if not the superior, of the diesel-electric in over-all operating economy when accorded the same kind of attentive servicing, when adjusted to use and when supplied with a uniformly high-quality coal.

There is a challenge to both railroaders and coal men. Mutual self-interest requires *aggressive action now.*

GREASE TRUCK
Saves Time and Money at Galloway

Service Station on Wheels Enables Two Men to Lubricate and Inspect 14 Machines in a Shift — Loader Can Be Greased in 10 Minutes — Saves on Production Time and Maintenance and Promotes Safety

★ ★ ★ ★ ★ ★



The grease truck is 13 ft. long, 6 ft. wide and 42 in. high. This illustration shows the cover of the meter and hose compartment raised ready for business.

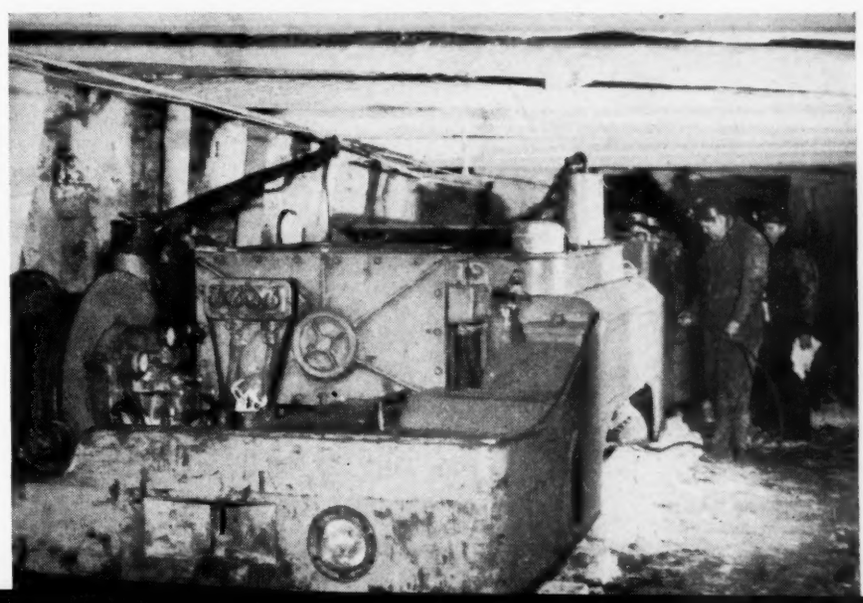
INCREASED production time, reduced labor cost and better maintenance of machinery lead the list of the several advantages which officials of No. 3 mine, The Simpson Creek Collieries Co., Galloway, W. Va., cite for a new factory-built grease truck installed in September, 1946. In this mine, now shipping 7,400 tons of mechanically loaded coal per two-shift day, and with more machinery on order for further expansion, two men operating the grease truck on the midnight shift service loaders, cutters and other equipment scattered over a territory 1½ miles in extent.

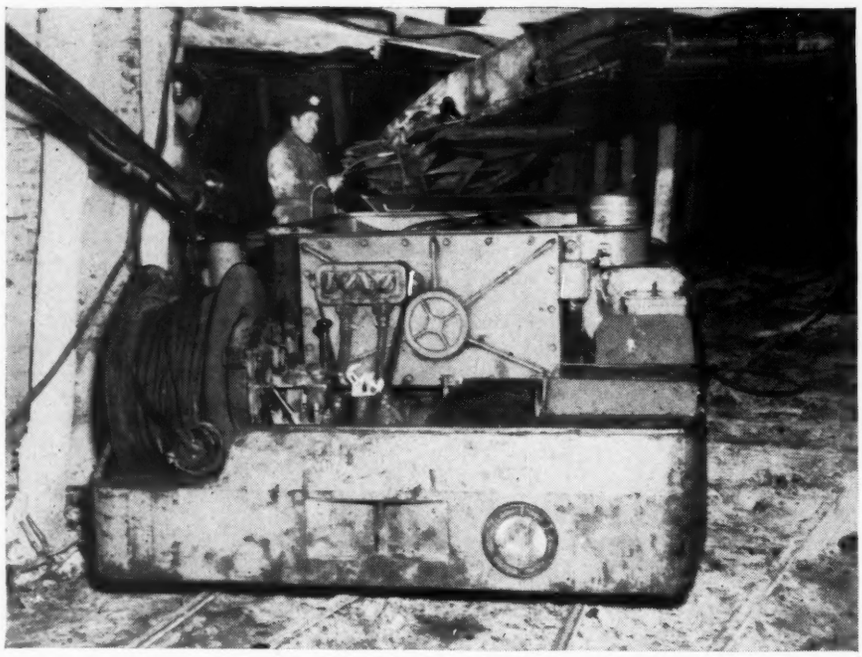
This grease truck, or "mine service station on wheels," made by the Lee-Norse Co., Charleroi, Pa., is a self-propelling trolley-and-cable-reel unit geared to operate at 6 to 8 m.p.h. The motors, consisting of one rated at 7½ hp. for traction and one at 3 hp. for driving the air compressor, are both 250-volt d.c. explosion-proof units. Their contactor-type controllers likewise are in explosion-proof cases. The truck has three separate tank compartments, each holding 2 bbl. and accommodating oil, transmission lubricant and chassis lubricant.

A hinged cover, or door, on top of the machine at the front end, is kept closed when the unit is not in use, to exclude dirt from a compartment housing the meters and three hoses with hand-valve nozzles attached. Wheels are 16 in. in diameter and axles are spring-mounted and carried in Timken bearings. The wheelbase is 42 in. and the track gage is the same. Grease and pressure guns are air-operated. Rated weight of the grease truck is 8,000 lb. empty and 10,400 lb. loaded with 6 bbl. of mine lubricants. Over-all dimensions are: length 13 ft.; width, 6 ft.; height above the rail, 37 in.

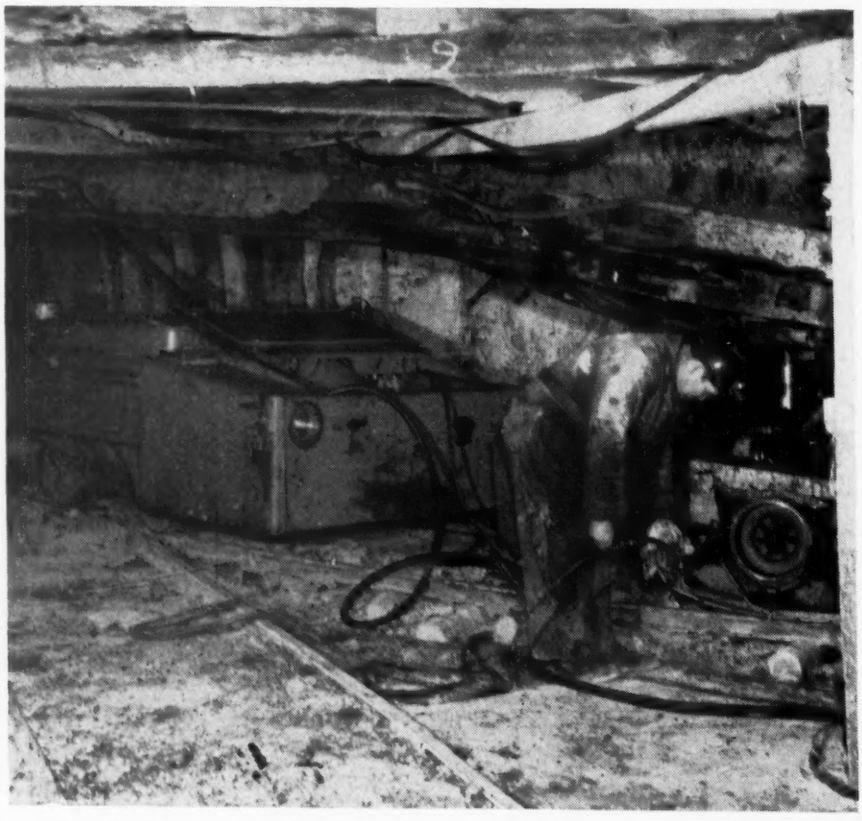
Galloway No. 3 mine, in Barbour County, 19 miles from Clarksburg, W. Va., is a drift operation in the Pittsburgh seam. Thickness is approximately 8 ft., but when the remaining undercutters are replaced with top-cutting machines the mining height will be 7½ ft. In tracked

The two-man crew is lubricating the track-mounted cutter in the background. The grease truck stands in the foreground.





Grease truck under the tail conveyor of a loading machine being lubricated. The cable reel of the truck is at the left, with the explosion-proof contactor-control box in the center.



Greasing the tracks of a loading machine. A compressor on the grease truck furnishes power for the grease pump and pressure gun.

sections, seven Sullivan 7AU machines do the cutting and five Joy 11BU and two Goodman 460 loading machines load directly into ten-ton eight-wheeled mine cars. Three other sections are trackless and use Joy machines loading into rubber-tired shuttle cars.

The grease truck is brought outside to the shop near the main portal each day for refilling the tanks. The truck serves not only for transporting and applying lubricants but also as transportation for the greaser and his helper. They start into the mine at 12:50 a.m. and during their shift lasting until 8 a.m., they service 14 machines (loaders and cutters) in the tracked sections and also fill cans for the shuttle-car sections. Each night they dispense about 75 gal. of hydraulic oil, 15 gal. of transmission oil and about a barrel of grease.

On Sunday nights the same two men, using the grease truck, lubricate shuttle cars, loaders and elevators (tipples) in the trackless sections. Only at the finish of the last shift of each week do the production men bring these loaders and shuttle cars to the elevator for this servicing. Greasing during the week in the trackless sections is done by the section mechanics, using manual pumps and grease guns.

By use of the grease truck a loading machine can be lubricated in 10 minutes if necessary. In No. 3 mine, however, since the time is available, the crew usually spends 10 to 12 minutes extra giving the machine a thorough check, noting temperatures and so on.

Production Delays Eliminated

Before installation of the grease truck, lubrication was handled by section mechanics during the production shift. That had many disadvantages. Machines were not always properly greased and machine production was stopped for 30 minutes while the greasing was being done. Wages paid to the production crew during the shutdown usually represented a complete loss. Section mechanics became fatigued, often slowed down on a grease job and sometimes became careless. Now, these men have more time and pep for preventive inspection and repairs.

Advantages of the new grease truck are numerous. Plenty of pressure insures injecting the lubricant into stubborn fittings or bearings. Lubricants are kept clean. Fire hazards are reduced by elimination of drips and spillage. Less lubricant is required per month because, with the old method, there was a loss in transportation due to cans tipping over, leaking and so on.

From George C. Auvil, chief electrician, to Harry L. Swihart, general superintendent, those responsible for maintenance and production at the mine agree that the grease truck is paying for itself in a hurry. At this No. 3 mine Paul Bashforth is superintendent and Tom Perry is general mine foreman. Irvin C. Spotte is production manager and assistant general superintendent, and Charles H. Lambur, with headquarters in New York City, is director of mining operations.

MAKING MINING SAFER

• Responsibility for Results

• Foundations for Progress

• Procedure for Results

ONCE AGAIN, an explosion, taking 111 lives at Centralia No. 5 mine, has placed the question of safety squarely before the coal-mining industry. How well is the coal industry—management, men *and* union—facing up to the problem of achieving maximum safety in mine operation? How must management, men, the union and other parties at interest proceed to eliminate injury, death and suffering in the future?

Explosions have in them the power to deal out death and destruction wholesale. But, bad as they are, they are not the real killers in coal mining. Falls of roof and underground haulage, which take men one or no more than a few at a time, account for three deaths out of four at the present time—and progress in these directions has not equalled progress in reducing the hazard growing out of explosions.

No amount of progress in the past, however, can cancel out the hard fact that each death and each injury, with exceptions so small as to be inconsequential, still are the result of failure to do what should be done. No man in coal mining or concerned with coal-mining safety can afford to close

EXPLOSION STOPPER—A product of logical procedure in preventing injury and loss of life in mine accidents, this rock-dust installation kept an explosion from probably spreading over an entire mine.

his eyes to the consequences of such failures. Some of them are:

By Management:

To really put safety first.
To provide safe equipment and materials.
To adopt safe and efficient working methods.
To sell safety and how it can be achieved.
To enlist the cooperation and assistance of the miner and the union.

By State and Federal Officials:

To enforce laws and codes.

By Miners:

To really put safety first.
To obey the law, safety codes and safety regulations.
To cooperate with and assist management and safety authorities.

By the Union:

To encourage and direct members to work safely and cooperate with local management and safety authorities.
To help with the job of showing how safety can be achieved.
To work with management and safety authorities to reduce injuries and fatalities.

Not all members of the management, official, miner and union groups, one should hasten to say, fail in all or many respects. Some fail in very few and the great majority really want to reduce the toll of life and limb in coal mining. But the record shows that there still is a big gap between desire and accomplishment—a gap for which all must share responsibility, a gap all working together can narrow to the minimum.

Facing up more squarely to the problem of safer mine operation requires a hard look at the causes of "accidents," for want of a better term, that result in injuries and fatalities. In fact, since it is known that permitting certain conditions to exist or certain actions to continue inevitably will result in an injury or fatality, the cause in many cases definitely is not accidental in the true sense of the word. Pure accidents do occur, but the vast majority are caused. That cause is human failure — failure to do a certain thing, or to refrain from doing another, thereby setting up the conditions leading to an accident, with the possibility — frequently becoming the actuality — of injury or death.

Human failure may be simply failure to sell the safety idea. It also may be far distant or remote in time and still result in injury or death. In the case of the explosion at the Nottingham colliery, in the anthracite region Jan. 15 this year, a contributing if not the main factor was an inaccurate survey (or plotting) in 1932. Determining the cause or causes at Centralia No. 5 must wait investigation, but a possibility that has been mentioned is cutting into an oil or gas well. Such wells, unreported, unplotted and unknown to the mine force, have resulted in ignitions in some mines in the past—an example of human failure even more remote.

Usually, however, human failure, whether it results in the death or injury of others or only of the man himself, is more immediate and more directly involved. The president of one of the largest companies now writing automobile insurance recently stated that only when individuals are convinced that they themselves are the keys to safer driving will fatalities and injuries on the highways begin to drop appreciably. Humans are prone to err, to take chances and to feel that the responsibility is the other fellow's. At the same time, humans have the power to think, to reason, to search out causes and to decide to do something about them. Determination, logical thinking and the taking of the steps that such thinking indicates therefore become the approach to greater safety in the mines and elsewhere.

It takes a combination of things to have an explosion, a roof fall or a wreck. Likewise, it takes a combination of things to eliminate explosions, roof falls, wrecks and other causes of accidents—in other words, to assure maximum safety in mining. At least three of the principal ingredients in the safety mixture are: (1) determination, (2) organization and (3) logical procedure.

It is an old principle that nobody achieves success in anything unless he is determined to do so. The same is true of mine safety. In too many

MINE SAFETY—1946 AND 1926

Falls and Haulage—Big Unsolved Problems

	1926		1946	
	Deaths per Million Tons	Percent of Total	Deaths per Million Tons	Percent of Total
BITUMINOUS				
Falls	1.73	48	0.80	56
Haulage	0.67	19	0.30	21
Explosions	0.65	18	0.06	4
All others	0.55	15	0.27	19
Total	3.60		1.43	
ANTHRACITE				
Falls	2.60	48	1.68	60
Haulage	0.62	12	0.35	12
Explosions	0.58	11	0.03	1
All others	1.56	29	0.74	27
Total	5.36		2.80	

KEYS TO SAFER COAL MINING

DETERMINATION—Complete acceptance of safety as the first consideration in all coal-mining operations and an unalterable resolve to do everything possible to eliminate the causes of injuries and fatalities, whether those causes are natural, physical or human.

MUTUAL EFFORT—Active participation of all parties in safety work, preferably on a joint basis. Management has a real responsibility, along with that of safety authorities, but the role of the miner—and of his union—individually and jointly with management, is no less vital.

ORGANIZATION—A plan and machinery for selling the cause of safety, showing how it can be achieved and channeling the efforts of management, men and other interested parties toward the desired goal of injury and fatality elimination.

LOGICAL PROCEDURE—Keying safety work to the facts of mining and then doing the things that logical thinking shows should be done—by both management and miner—to remove the causes of accidents, whether personal working practices, mining methods or machine or mine condition, thereby eliminating injuries and fatalities.

instances, still, what is offered as determination is little more than the statement that safety is a good thing. Real determination is reflected in action—action whenever and wherever results can be obtained. It is willingness to spend money on the part of management, to understand and cooperate on the part of men and to help the cause along, through educational efforts and otherwise, on the part of the organizations representing the workers. One party may have the determination but not the others. If that is the case, the situation is an improvement but still falls short of what really is necessary. Both management and men must be determined to have safety and to do anything that is necessary to that end. Without determination, anything that is done in other directions is largely nullified.

Uncoordinated efforts are as bad for safety as for any other mining endeavor. To achieve safety results, therefore, organization is absolutely necessary. The form can vary somewhat in accordance with conditions but organization nevertheless is necessary to give direction to the work, coordinate the efforts of both men and management, carry on the necessary educational and other work (including first-aid and rescue training), and set up rules of procedure and standards of operation that will bring the desired results. Someone, somewhere in the organization, must be charged with the responsibility for achieving safety and for the means employed to attain it.

Since more than one party is involved, organization for safety logically should be a joint project, along with the active steps taken to attain it. By that same rule, there is good reason for a top industry-wide organization representing operators, miners, state and national safety authorities and other parties with an interest in the problem. Such an organization, motivated by a sincere determination to advance the cause of safety, would be a real step toward establishing the climate in which safety could thrive and toward a situation making local efforts more productive.

Since safety, as has been pointed out, finally becomes largely a personal and individual matter, the greater part of the work must be done on a company and mine basis. Since, also, men as well as management are involved, it is equally logical to operate through an organization to which both contribute. In fact, active efforts by the miners themselves—and by their organizations—is considered to be the next major step forward. Consequently, every effort should be made to provide a place for them, get them interested and — more important — actively participating.

A joint organization that brings men together with management therefore is a natural next step. Management, while exerting itself to the utmost where its efforts can contribute, therefore should encourage and foster miner participation. It makes the job easier and enhances the results. If cooperation and participation were backed and encouraged by the union, with it itself participating in the top coordinating group, the stage would be even better set. Here is a real opportunity for the union, along with the opportunities open to management and men.

When it comes to the actual work of removing the causes of accidents, logic again shows clearly what needs to be done. To bring about an accident, there must be a combination of circumstances. In the case of a fall, for example, the ingredients include a loose rock — or a rock that could come loose — a lack of support or, contrariwise, no attempt to take it down, plus a man in place to be hurt or killed if and when the fall takes place. Another example is a passing trip, a tight place along the rib and a man with no place to duck. A further one is gas or coal dust in the right proportion to ignite plus a fire or spark.

When gas or dust is present in the right proportions and a fire or spark is introduced, an explosion is bound to result. If the gas or dust is diluted

with air or rock dust or removed, the fire or spark has little to work on. If the possibility of a fire or spark is removed, by such means as the use of permissible equipment and explosives, a prohibition against open lights and smoking, and so on, an additional explosion ingredient is eliminated and the chances of an ignition further reduced.

How the Public Judges

Explosions, to repeat, are spectacular. They also are the basis on which the public, for lack of better knowledge of the real situation, tends to judge the safety accomplishments of the industry, as time has shown over and over again. That is one good reason for special attention to their elimination. Another is the cost to the operator and to the industry in the form of compensation, property damage, recovery and rehabilitation expense and loss of profit during the period of interrupted production.

Paramount, of course, is the loss of human life and injury. One aspect of the problem is the fact that explosions can cause wholesale death and injury. If the number of explosions were to increase materially, the injury and fatality picture in coal mining could be changed so sharply that even great and immediate progress in the fields of roof falls, haulage and elsewhere would not offset an adverse trend.

Compared to the earlier days of universal hand loading on a single shift, mechanical mining with multiple shifting and smaller crews reduces the exposure in explosions but also introduces more sources of ignition. Lately, in addition, there has been a slight but significant trend toward concentrating output into mines with larger individual capacities, thus increasing the exposure. The presence of as many as a thousand men in one operation at one time may not be too unusual in the future, making it even more imperative to take every precaution against the start and spread of an explosion.

Since it is well known — to both management and men — that certain combinations of elements or certain personal ways of doing things can result in accidents, with their attendant possibilities of injury and death, the way to greater safety becomes plain. It is simply doing the things that logically should be done, whether these are the installation of safer machinery, better housekeeping, better air to dilute and remove gas, sprinkling to keep down dust, rockdusting to render dust non-explosive, no smoking or open lights underground, systematic timbering and the taking down of loose top to prevent falls, a determination by all persons involved to personally conform to safety rules and standards and so on. If logic dictates an expenditure for safer machinery or for special facilities for promoting safety, a revision in working methods or a change in personal practices, it naturally should be made without hesitation.

Real progress has been made in reducing injuries and fatalities in coal mining. But the fact that explosions, falls, wrecks and other accidents still occur should be a challenge to every man in the coal-mining industry, whether management, miner or miners' representative. Regret for the omissions and mistakes of the past — and for their results in injury and death — should add a keener edge to the determination to prevent them in the future and thus hasten the day when an injury or fatality in coal mining will be a rarity.

The stake is more than merely money or a personal reluctance to change from a careless to a safe way of mining coal. The real issue is human life and suffering—whether one is willing, whether he be a management man, miner, miners' representative or public official, to do, or fail to do, something that experience has shown will result in injury or death. It is serious enough when that action, or lack of action, hurts only the man—and the family of the man—himself, but when it injures or kills others, it goes far beyond what license there may be granted human frailty.

The record shows progress, but it also shows that coal has yet to accept completely its paramount responsibility for doing everything that possibly can be done to eliminate injury, death and the suffering of loved ones. Am I endangering myself? Am I—more importantly—endangering others? Until every man in coal mining can answer these questions with an emphatic "No!"—and prove it by the record—he cannot consider that he has discharged completely his biggest responsibility.

Real Job — Real Rewards

Determination, organization, logical procedure and mutual effort are the keys to safety progress. Much of the reponsibility falls on management, but the worker and his representatives have their share, too. Both must be prepared to contribute as necessary in money and effort. But the rewards are worth it. Among them are the following:

To the Miner—The knowledge that he can look forward to a working life in an industry paying high wages free from the hazards of injury or death, plus the further knowledge that his family and dependents will be free of the possibility of grief and hardship.

To the Operator—Higher efficiency, since the safe way is the efficient way; lower cost and the satisfaction that he has done his part in preventing injury and death.

To Both—Increased public respect and freedom from outside interference as a result of their own efforts to make coal mining a really safe industry.

CABLE PROTECTION
With Automatic Circuit Breakers

Immediate Power Cut-off Necessary to Prevent Fire and Other Hazards and Get Maximum Benefits of Flame-Resistant Cables—Circuit Breakers With Magnetic Trips Provide Instantaneous Protection

By R. G. GEHLSEN
Manager, Mining Sales, Mines Equipment Co., St. Louis, Mo.

MANY experiences can be related of mine fires initiated by arcs resulting from the short circuiting of conductors in a cable. Once the arc is created, by one of many causes, it is possible to burn up several feet of cable. Fire hazards and acrid fumes are the result, endangering personnel and even the mine itself.

The advent of flame-resistant cable is a very worthwhile advance, yet there is no hope of preventing cable fire hazards as long as power remains on the defective cable. It is only after the power is removed that the flame-resistant jacket becomes highly desirable. As is well known, an arc can be created between conductors of a cable and, where the insulation maintains a fixed distance between conductors, power remaining on, the situation is similar to that which exists in arc welding.

Cable Failures of Two Types

In general, cable failures fall into two classes. Failures in the first class result when the conductors are brought solidly together, resulting in copper-to-copper contact. The second cause of cable failures —and by far the most difficult to provide protection against—is the high-resistance short circuit.

Solid short circuits result in maximum current flow, which is limited only by the resistance or impedance of the circuit. The protective device employed to remove such short circuits receives a maximum flow of sustained current, which increases its ability to open the circuit-protective device. Cable failures in this class are in the minority and are easiest to remove from the line.

High-resistance short circuits predominate in cable use. They are principally caused by poor splices that become water soaked, deteriorated cable on cable reels or spooling devices and various other conditions permitting only a few strands of wire from each conductor to contact similar strands at opposite polarity. A high-resistance short circuit is one that limits the short-circuit current in the failure itself. Tremendous heat results in a very definite local spot, although not producing enough current flow to open a fused circuit. Thus, the arc continues to live, creating genuine hazards to personnel and property.

Automatic circuit breakers are the answer to the problem of providing modern protection to power cables that sustain various kinds of injuries resulting in solid or high-resistance short circuits. The automatic circuit breaker is provided with an instantaneous magnetic trip. The function of the magnetic trip is to open the breaker when a short circuit occurs and produces trip current. Opening is accomplished in approximately 1/120 to 1/30 of a second, depending on the size of the breaker involved.

Speed in removing a solid short circuit from the line is highly desirable. Many shorts start solid, as represented by a few strands of opposite polarity coming together. Tests have been conducted showing that the few strands involved melt off and open the breaker at the same time. Such a condition as this would in all probability not yield enough sustained current to melt a fuse link. Thus, the instantaneous feature of the magnetic trip is highly desirable.

This kind of protection can be expected with repeat performance assured. All that is needed to restore power is to move the breaker operating handle to "Reset" position and then to "On." No tools or parts are required.

It is readily recognized that only a portion of the cable failures that occur are in the class causing a flow of current substantially in excess of normal requirements. This is principally because of the absence of solid copper-to-copper conductor contact. Furthermore, long lengths of relatively undersized cable tend to reduce maximum short-circuit current as a result of natural resistance, plus a possible high-resistance splice. Thus, in providing short-circuit protection that must be actuated by a flow of current in excess of normal requirements, only partially satisfactory results can be secured.

Mining Machines Protected

The automatic circuit breaker, with its recently developed safety ground-trip auxiliary, provides protection against fire hazards born of high-resistance short circuits in cables. Furthermore, the safety ground trip provides protection for the electrical equipment of the mining machines. Should the mining-machine electrical insulation break down and permit 5 or 10 amp. to flow in the safety ground wire, the breaker will open.

Fig. 6 shows a typical layout using an entry safety-circuit center with an automatic circuit breaker to carry all equipment at the face. The magnetic trip of the breaker provides protection to the extension cable (Item 4) when solid shorts occur. Should an arc be established through a failure of insulation on the extension cable, then one or both of the No. 10 control wires will be burned in two, causing the undervoltage release to be deenergized and opening the breaker.

The machine cable may be of either the round or parallel type, as shown in Fig. 6. In the parallel

type, the cable-failure arc must touch the safety ground wire, whereupon power flows from positive to negative, causing current to flow in the safety ground-trip coil (3), which is set to open the breaker on 10 amp. Furthermore, the safety ground wire is already at negative polarity and so it is conceivable that a power arc could not be established as a result of the safety ground trip opening the breaker when only 10 amp. flows.

Tripping on fault current for round cable is achieved in similar fashion because of the fact that cable construction now permits the safety ground wire to be bare and half the size of a main conductor.

Now, let us further consider the establishment of the trip value of the instantaneous magnetic trip in the automatic circuit breaker. Magnetic trips in breakers up to and including the 225-amp. size are adjustable through an approximate three-to-one range. Automatic circuit breakers are applied with adjustable instantaneous magnetic trips to suit the load requirements.

Final adjustment is left to the responsible party in charge of placing the equipment in service. It is recommended that the trip be set at not more than 10 percent over the value attained in normal service. To do this, all that is necessary is to start with the setting too high and keep reducing the trip value until the breaker opens on normal peak currents. The adjustment is readily accomplished by a small lever over each load terminal of the breaker in certain new 100- and 225-amp. frames. The 100-amp.-or-less frame has a visual slide adjustment under the cover.

Trip Settings Vary Widely

Experience with two identical machines in separate mines showed that the adjustable magnetic-trip setting varied 35 percent. Variation in settings can be attributed to differences in working conditions and the length of feeders with their different values of generating capacity behind them.

With this experience in mind, it is readily conceivable that one fixed setting for cable protection for a certain machine provides only false security. There are so many variables that only an adjustable instantaneous magnetic trip will actually provide tailor-made protection for the cable for which it is intended. Thus, automatic circuit breakers with adjustable instantaneous magnetic trips and safety ground-trip auxiliaries used in conjunction with a safety ground wire will provide genuine cable protection regardless of whether the cable failure is of the solid-short or the high-resistance type.

In the design of a "Permissible Distribution Box" the federal government has issued Schedule 2E regulating the specifications. A paragraph covering inlet and outlet plugs states that "Junction boxes shall be provided with plug or plugs as follows: arranged and interlocked to prevent connection or disconnection of a portable cable while contacts in the plug receptacles are alive, or capable of opening and closing the circuit under load, if necessary, without injury to themselves or to any part of the box, hazard to persons, or danger of causing an ignition of methane or coal dust," etc.

Federal Requirements Met

The design of the new safety circuit centers (Fig. 4 is an example) realizes the federal specifications through the use of automatic circuit breakers and connectors (Fig. 3) employing an intrinsically safe control circuit in conjunction with an undervoltage release auxiliary (Fig. 6, Item 2), which is a component part of the automatic circuit breaker.

This combination results in an assembly of automatic circuit breakers, connectors, etc., which is simple in operation and stays permissible. No tools are required to replace parts since all that is necessary to restore power, after cable repairs are made, is to move the breaker operating handle to "Reset" position and reclose.

The simple act of opening a connector (Fig. 3) will drop the power from the circuit when the connector is partially disengaged. This is accomplished through an arrangement of short and long pins in the connector, employing the intrinsically safe control circuit. Cable extension for sectionalizing purpose can be achieved by employing two No. 10 pilot wires in with the main power and ground conductors (Fig. 6, Item 4). The cable is similar to the standard type with three small ground wires, but is converted by insulating two of the wires and leaving the third out altogether. The cable type then becomes "Power, control, ground (one-half size)."

The intrinsically safe control

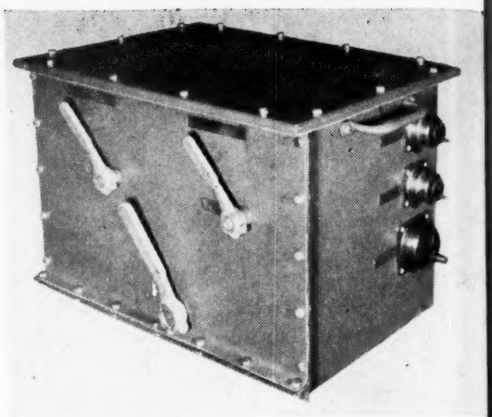


Fig. 1—Entry safety circuit center from output end.

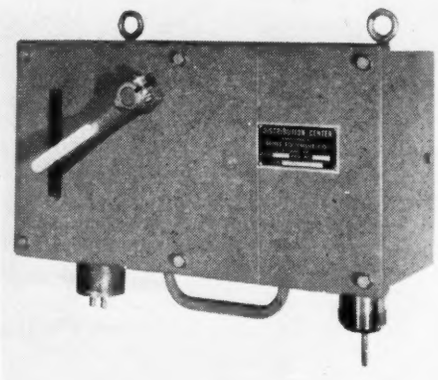


Fig. 2—Hanging-type safety circuit center for serving single machine.

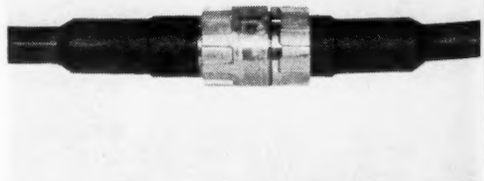


Fig. 3—Coupling connector.

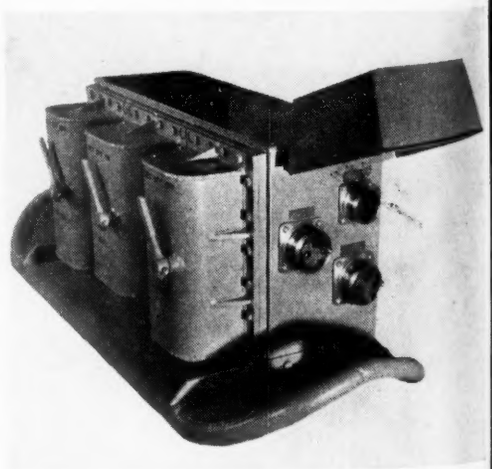


Fig. 4—Permissible distribution box (face safety circuit center) showing output end.

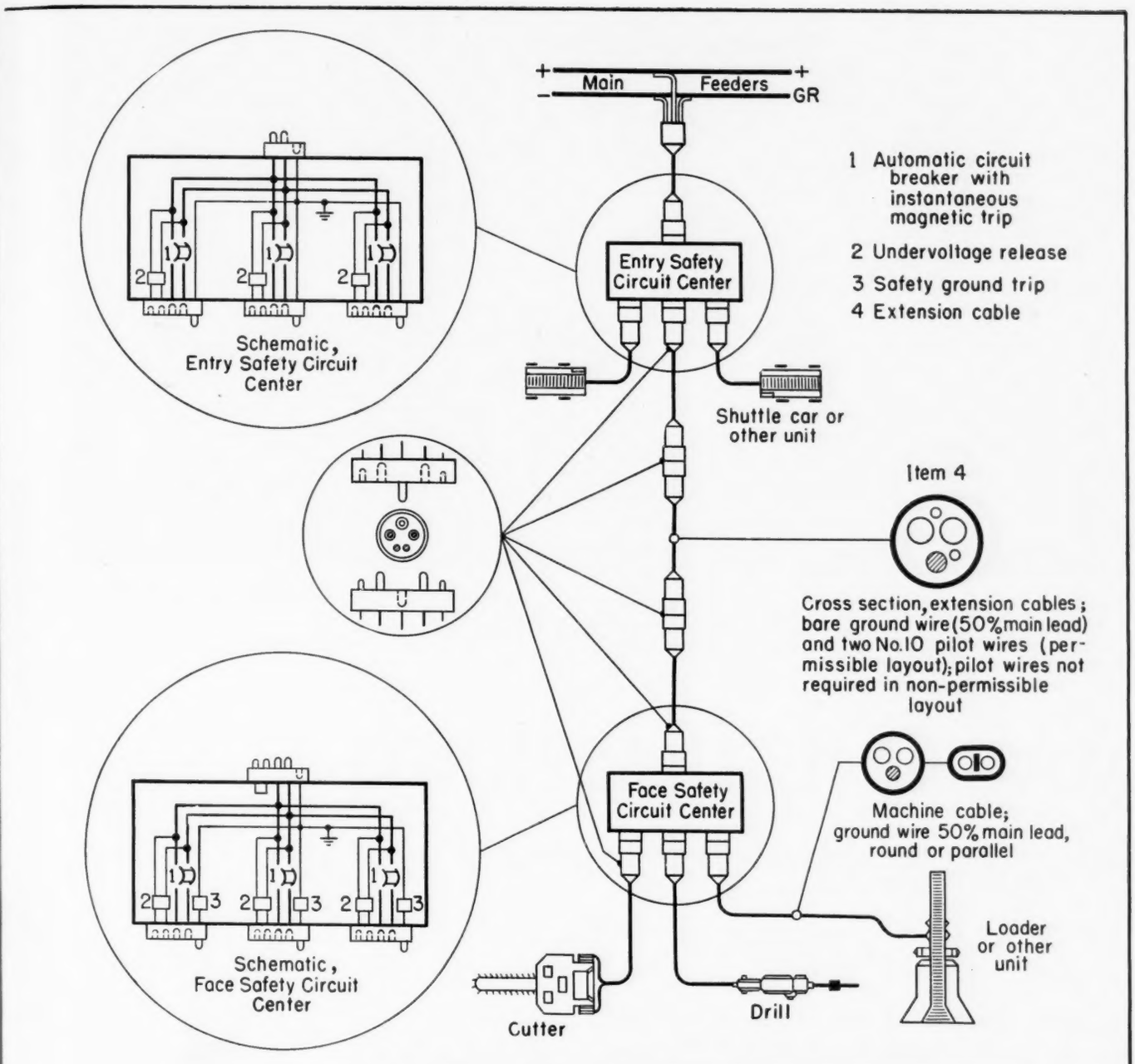

Main Feeders
GR
1 Automatic circuit breaker with instantaneous magnetic trip
2 Undervoltage release
3 Safety ground trip
4 Extension cable
Entry Safety Circuit Center
Schematic, Entry Safety Circuit Center
Shuttle car or other unit
Item 4
Cross section, extension cables; bare ground wire (50% main lead) and two No. 10 pilot wires (permissible layout); pilot wires not required in non-permissible layout
Face Safety Circuit Center
Machine cable; ground wire 50% main lead, round or parallel
Schematic, Face Safety Circuit Center
Loader or other unit
Cutter
Drill

Fig. 6—Modern power-distribution system employing safety circuit centers.

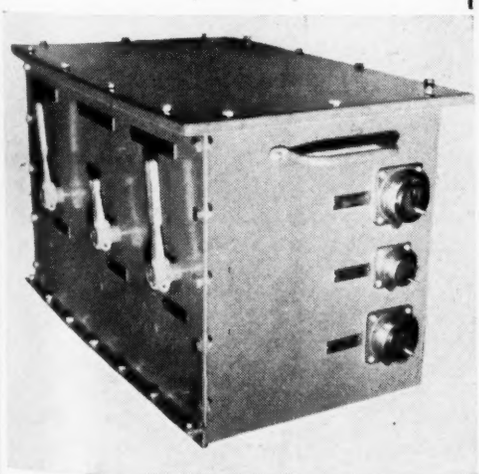


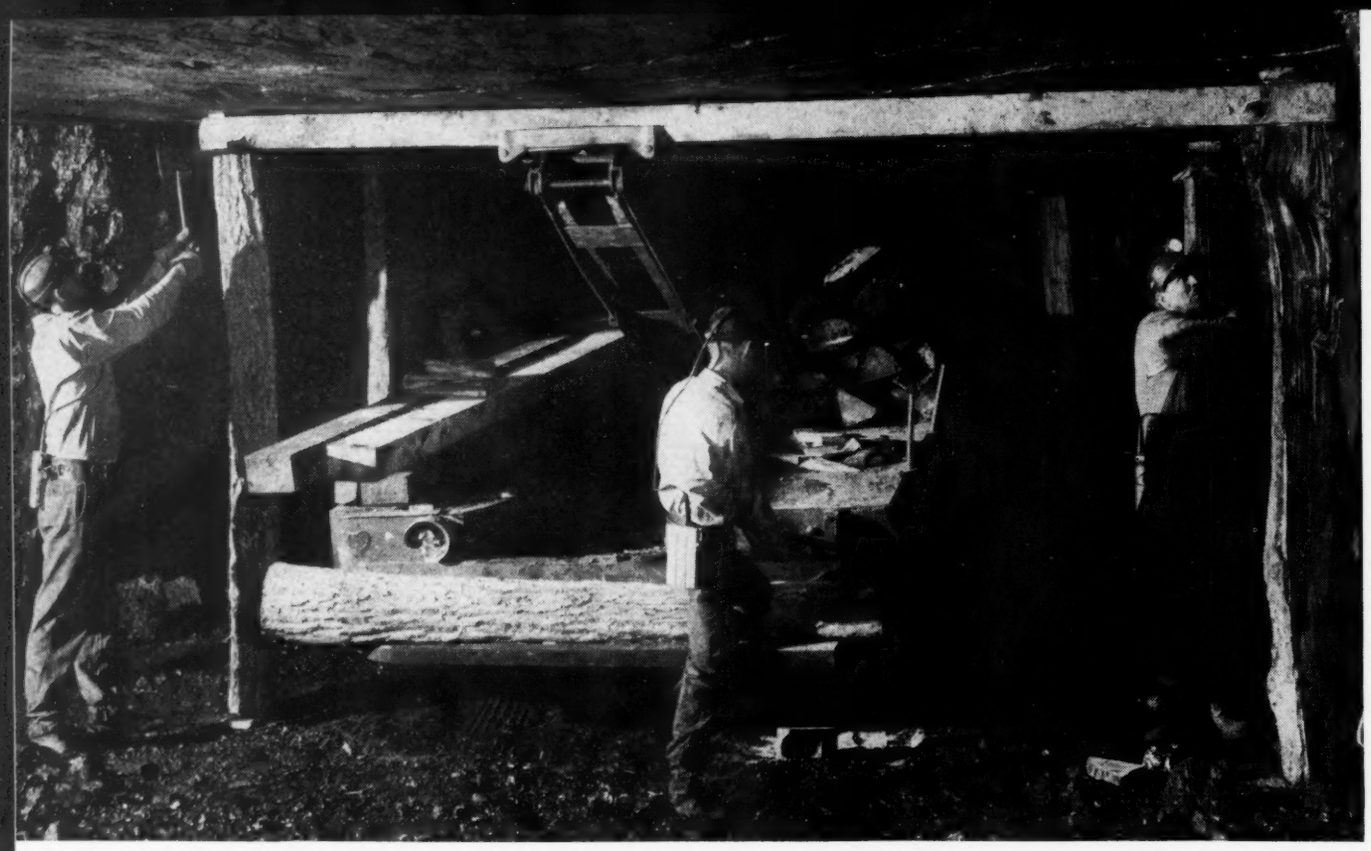
Fig. 5—Non-permissible distribution box—front side and output end.

circuit established with the two No. 10 pilot wires gains its name from the fact that the magnetizing current of the breaker undervoltage release, when made and broken repeatedly in 8.6-percent methane, will be non-igniting as tested by the Bureau of Mines laboratory.

The undervoltage release mechanism is an auxiliary under the circuit-breaker cover. It was developed to open breaker contacts when the line voltage falls to 50 percent or less and permits reclosure with 65 percent or more.

Safety circuit centers with automatic circuit breakers, either permissible (Fig. 4) or non-permissible (Fig. 5), are available for distribution of power at the face. Entry safety-circuit centers are arranged as in Fig. 1 for multi-outlet service and Fig. 2 when a single outlet is required; for example, shuttle-car protection. Selection of current capacity at 250 or 500 volts d.c. or 220 or 440 volts a.c., for one, two, three or four outlets can be varied to accommodate drill, loader, cutter or other equipment used.

A modern power-distribution system is now available which minimizes fire hazards and provides maximum protection to personnel and machines. This system is made possible through the application of automatic circuit breakers (a.c. or d.c.) in conjunction with connectors that are easily engaged or disengaged.



The second and successful timbering machine in action. It was built for thick-seam mining and is shown here working in an extra-high place in No. 1 mine.

MACHINE TIMBERING
Promotes High Efficiency at Gay Mines

Company-Developed Timbering Machine Cuts Timbering Crew From Five to Three Men — Loading-Machine Output Increased 40 to 50 Tons per Shift — Saving in One Year $40,000 on 350,000 Tons

By J. H. EDWARDS
Associate Editor, Coal Age

A PRODUCTION per man-shift 29 percent greater than its nearest competitor among the deep mines of the State was the record of Ben Creek No. 1 mine of the Gay Mining Co., Mingo County, West Virginia, after installing a timber-setting machine. The timbering crew was cut from five men to three, yet the face preparation was so improved that 40 to 50 tons more was produced per loading machine. In one year, the machine saved $40,000 on 350,000 tons of production. A varying but weak roof calls for headers in every working place. Definite standards are followed in road timbering, with special emphasis on the method of setting headers at turn-offs and intersections.

Harry S. Gay, vice president and general manager of the Gay Mining Co. and the Gay Coal & Coke Co., is the daddy of this timbering machine. He and Thomas Maynard, of the Maynard Machine & Electric Co., Williamson, W. Va., hold a patent (No. 2,408,387) on it and have entered into an agreement with the Joy Mfg. Co. for the manufacture and marketing of the machine under this patent, but redesigned by the Joy engineers to meet a wide range of mining conditions.

In turning to the use of a machine to lick the timbering problems encountered shortly after opening the new Ben Creek in May, 1942, Mr. Gay operated once more in the family tradition of progressive mining engineers. His father, the later Harry S. Gay Sr., who was vice president and general manager of the Gay Coal & Coke Co., which shipped the first car of coal from Logan County in 1904, speaking on June 14, 1907, before the Institute of Mining Engineers in London, made the prophecy—then astounding—that mining would be done mechanically. Harry S. Gay worked with his father through the

early experiments with mechanical loaders beginning in 1920 and later made the Gay Coal & Coke Co.'s operations the first in Logan County to do all loading mechanically.

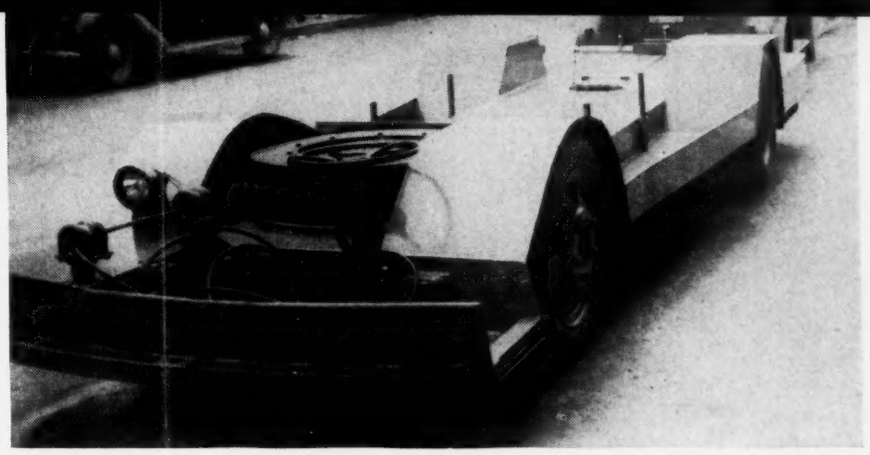
Ben Creek No. 1 mine of the Gay Mining Co. is in a fairly level seam without continuous partings in a non-gaseous area. Thickness ranges from 6 to 9 ft. Over most of the mine, the immediate top is 8 to 10 in. of rashy drawslate and above that is a weak sandstone varying in character, occurrence and thickness. In some places, the drawslate is absent and there the immediate top is the uncertain sandstone. Maximum cover is 300 ft.

Shuttle Cars Serve Loaders

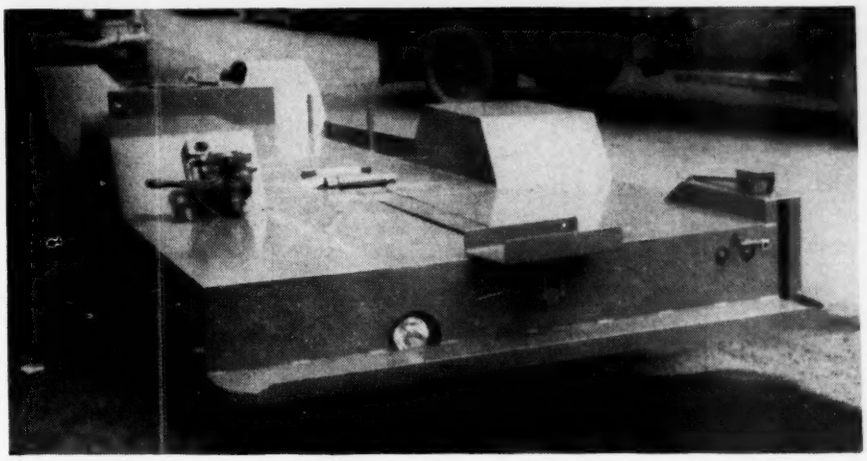
Two Joys load to 5-ton cable-reel shuttle cars which, through elevators, deliver to 7½-ton drop-bottom mine cars. All places are driven 18 ft. wide and all breaks and turns are at 60 deg. Taking of pillars has been deferred pending the mining of a 50-in. upper seam (No. 2 mine) 80 ft. above, in which territories are now being developed.

In No. 1 mine, the coal is undercut 7 ft. Shortwall machines are transported from place to place on Joy T-2 crawler-type trucks. Shooting is done with Cardox using six tubes per 18-ft. face. By this method, the coal is rolled out in good shape for loading and there is a minimum of disturbance of the drawslate which, as a rule, is held in place by setting two to three headers per cut.

Present operations are on a two-shift basis, but to explain the background of the timber-setting machine it is necessary to look back to 1942 and 1943, when the mine was operated with but one Joy 11BU loading machine working three eight-hour shifts. Early in that period, production was 1,200 to 1,400 tons per day—not bad, most operators will admit—but F. E. Vincent, superintendent, and Mr. Gay saw much room for improvement in face preparation. At least five men per shift were engaged in timbering, but there still were delays while it was being carried out. Development and installation of a satisfactory timber-set-

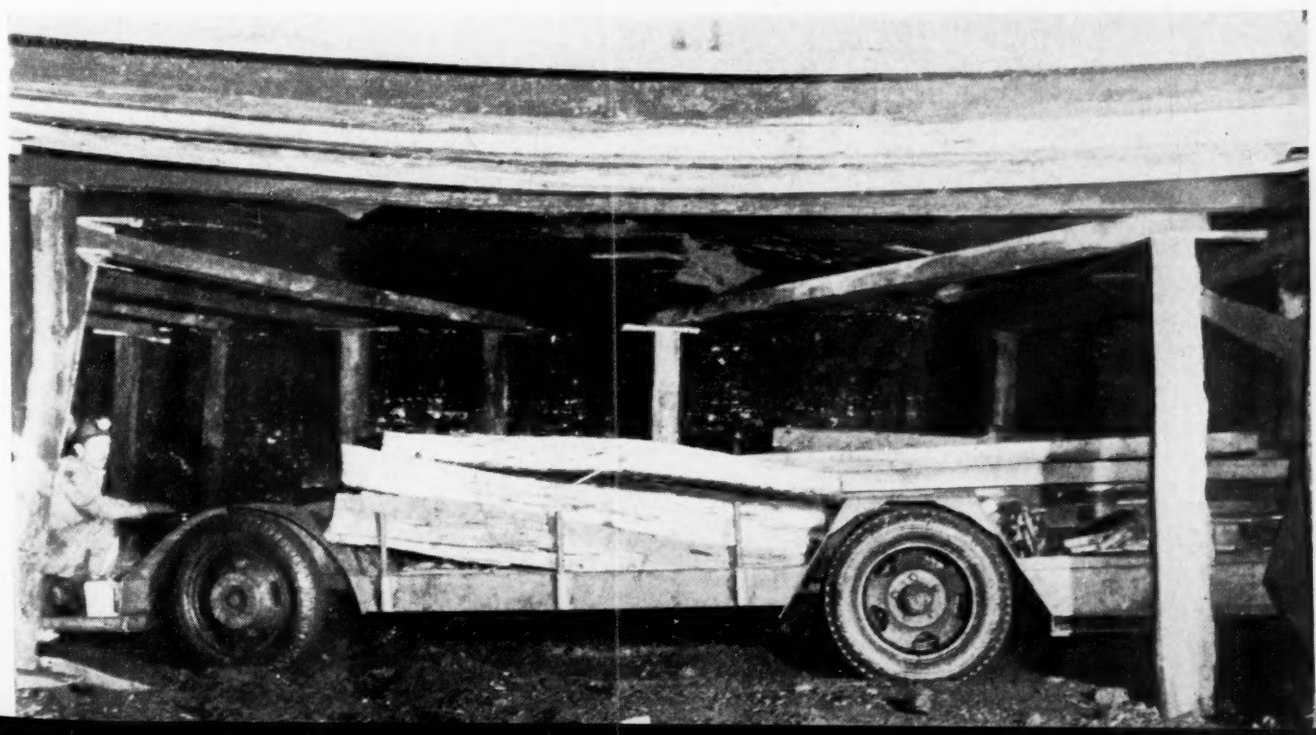


The third design of the machine (35 in. high) was built at Williamson, W. Va., for the 50-in. coal of No. 2 mine.



Inby end of the third machine, showing hydraulic control valve, end of boom with header plate (center), sawing step, and handle and slot for saw (extreme right).

Borrowed from No. 2 mine in an effort to maintain tonnage with double-shift operation in No. 1 (6- to 9-ft. seam), this third low-vein unit is shown on its way to the face loaded with headers and posts.



Timbering machine approaching the face. Empty carbon-dioxide tubes are carried in a box at the upper left.

Using the hydraulic control a man is raising a crossbar against the roof. Blocks under the bar are not regular practice. An adapter extension had been left in the other mine.

With the header held against the roof, measuring, cutting, standing and wedging posts are facilitated. Blocks, as noted, are not regular practice. An adapter extension had been left in the other mine.

ting machine made it practicable to reduce the number of timbering men per shift to three, yet the face preparation was so improved that the tonnage from the one machine was raised to 1,600 to 1,900 tons per day.

40-Minute Delay Reduced

Without the timber-setting machine, the average delay per shuttle car was 40 min. per shift because it was necessary to use the cars to carry timbers. Otherwise, the men had to carry headers and posts as far as 400 ft. Even when carrying the material in shuttle cars it quite often was necessary to unload it 100 ft. or so back from the face to avoid blocking other mobile equipment. Due to disabilities and accidents from lifting and carrying the heavy headers of green timber, compensation cost was high.

A spare shuttle car for carrying timber would have been a partial solution but, as it turned out, the locally built timbering machine cost considerably less and has served much better. In addition, the timber-setting machine effects an appreciable saving in labor in the use of Cardox. Formerly, men carried the empty tubes two at a time to the station on the section. Now they are carried on the timbering machine.

Built by a local shop at Logan, W. Va., the first timbering machine was not a success. It had too many bugs in it. Consequently, Messrs. Gay and Vincent worked out the preliminaries of a new design and put it up to Thomas Maynard, of the Williamson shop, to work out the details. The result was the machine which saved $40,000 in one year in Ben Creek No. 1 mine. Production per man, counting all men employed inside and out, for January to September, 1943, inclusive, was 3,151 tons, while the next best among other mines in the State was 2,437 tons.

Low-Coal Machine Built

In July, 1946, the upper seam, 50 in. thick, including impurities, was opened and bad top also was encountered. Loading is done with a Joy 14BU delivering via an elevator into 3½-ton drop-bottom mine

Man at the right wedges the post under the header while the one at the left loads empty carbon-dioxide tubes into a box on the timber-setting machine. Blocks between saddle and header are not standard practice. An adapter extension had been left in the other mine.

cars. This new No. 2 mine also requires close timbering with headers. Consequently, a lower type timber-setting machine was developed and built by Mr. Maynard at his Williamson shop. This model is but 35 in. high and can be made 32 in.

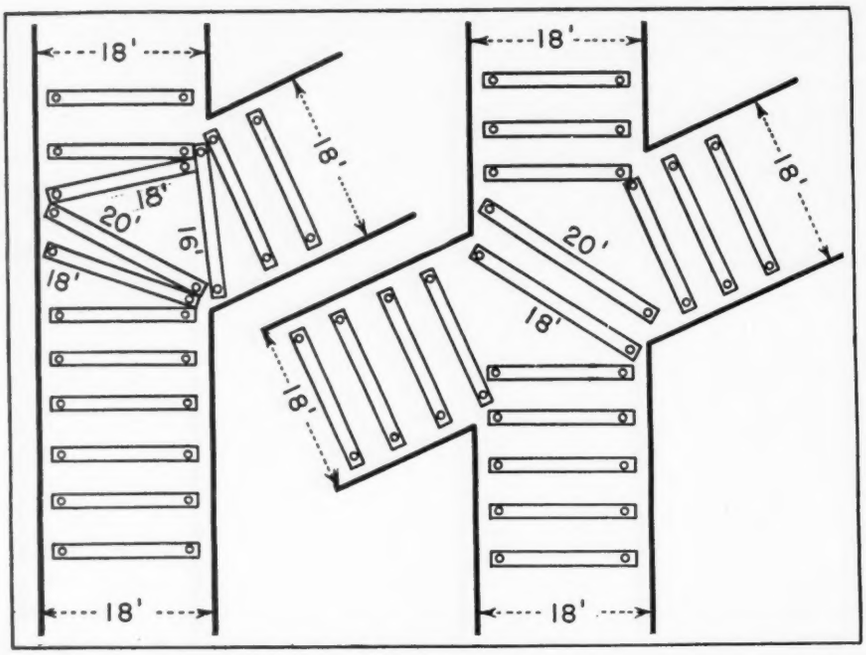
Each Section Uses Machine

Due to the manpower problem it became necessary to change from three-shift to two-shift operation in No. 1 mine and to put a second section into operation to maintain tonnage. Therefore, the low-type machine has been borrowed from No. 2 mine. On the day that the working photographs of this low machine were made, blocks were being used between the boom saddle and header. That is not the regular practice. An adapter extension had been left in the other mine. Mr. Maynard is now completing a duplicate low machine for No. 2 mine.

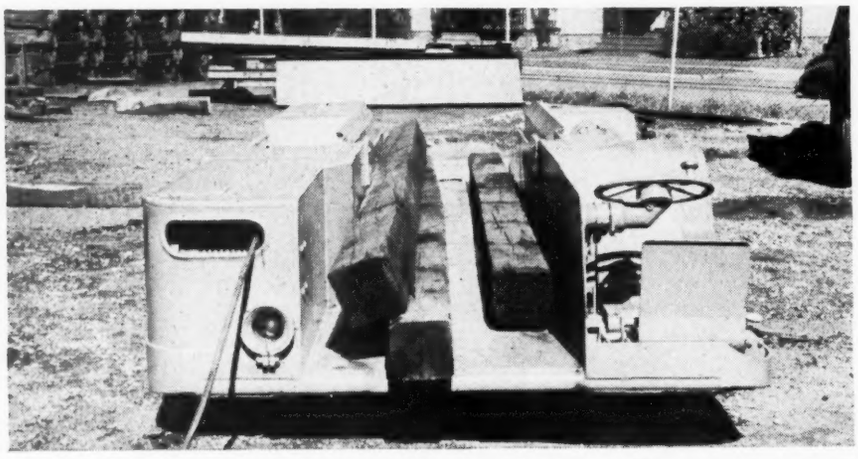
In a five-heading entry, it is normal to use one 11BU and one 7BU. The latter, which originally was a 5BU, was rebuilt to accommodate parts from other types and is now dubbed a "7BU." One preparation crew takes care of a whole set of five headings and the crosscuts comprising an entry development. The normal cycle is to prepare two places on the left for the 7BU and then switch over to the right-hand side and prepare three places for the 11BU while the 7BU is loading. The latter is not strong enough to stand crowding. It was intended as a spare and will revert to that status if the mine should resume three-shift operation. The three men comprising the crew of the timber-setting machine also clean up the face ready for cutting and gather the empty Cardox tubes.

Placed on the step at the end of the machine, a post is quickly cut to length—and cut square—with the swinging arbor saw.

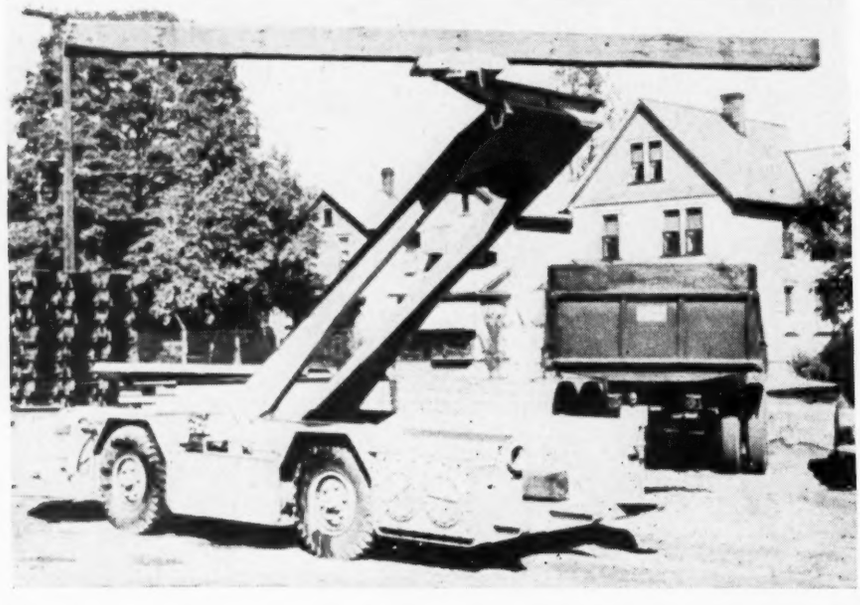
Headers are 14 ft. long and are



Left—Timbering plan for turning single places; right—plan for intersections. All headers are 14 ft. long except as noted. The parallel 14-ft. headers are on 30-in. centers while the headers beyond are on 5-ft. centers.



Commercial design of the timbering machine under the Gay and Maynard patents. It resembles a shuttle car and has explosion-tested electrical motors and controllers.



Commercial machine with the boom raised to a maximum height and the carrying saddle adjusted to a position well to one side of the center. The saw is at the right of the timber-cutting step.

sawed 4x8's or 6x8's, whichever is deemed necessary for the top conditions being encountered. As previously mentioned, two headers are set per cut in every working place. Posts, averaging about 7 ft. in length, must be 6 in. across the small end whether split or round. A minimum of 5 ft. has been established for centers of permanent headers on the main line. Where single places are turned off, and at crossings, the header center distance is 30 in. The standard minimum arrangement of the headers at these intersections is shown in the accompanying drawings. Special headers 16, 18 and 20 ft. long are used at the intersections.

The essentials in the design of the timber-setting machine are: rubber tires; two-wheel steer, self-propulsion through a cable reel, disappearing circular cut-off saw with swinging arbor, hydraulically operated boom, a turntable under the saddle that supports the header, and storage space for carrying a supply of headers and posts.

Commercial-Machine Design

The several machines that have been built for the Gay Mining Co., or under the Gay and Maynard patents, vary in mechanical details, motor horsepowers and arrangement. The design being turned out by Joy has a double-arm boom, with space between the arms for carrying timbers between. It also includes a sliding arrangement for the header-carrying saddle so that the lifting point can be operated off center from the machine.

As shown in the illustrations, a post is cut by laying it on the step at the inby end of the machine and swinging the saw out by pulling on a handle about 12 in. away. The usual method is for a man to brace his knee or foot against the post at a point about 1½ ft. from the saw, push a button to start the saw and then pull the handle.

Officials of the Gay Mining Co. are rightly enthusiastic in their praise of the timber-setting machine. Experience with it brought out advantages not taken into account when it was decided to try building such a machine. Now, officials at the mine wonder how they ever operated without it.

DUST CONTROL
In Anthracite Mining Operations

How Use of Water on Equipment and Before Blasting and Loading Keeps Down Dust, Facilitates Dissipation of Smoke and Fumes and Aids Ventilation—How Water Is Obtained, Distributed and Used

By R. EMMET DOHERTY
Engineering Staff, Anthracite Institute, Wilkes-Barre, Pa.

OPERATION of coal-mining equipment necessarily results in the production of dust, the type of dust varying with the material—coal, siliceous rock or other. Another essential activity—shooting—produces smoke and fumes. In the past, operators and State authorities have relied on ventilation to keep such products from becoming hazards. Where the ventilation is good, it is a long step toward attainment of the desired conditions, although less effective with dust than with smoke and fumes. To make assurance doubly sure, however, the mining industry is supplementing measures already in effect with dust suppression. These control measures are relatively inexpensive and have the additional advantage of keeping the air clear at all times, thus insuring working conditions conducive to higher efficiency and, through better vision, reducing injuries from falls of roof and ribs, stumbling, running into coal, timbers and equipment and similar accidents.

Since dust, fumes and smoke normally originate in related operations and in the same place, measures for the control of one usually take care of the others. Some of these measures are outlined in the following material.

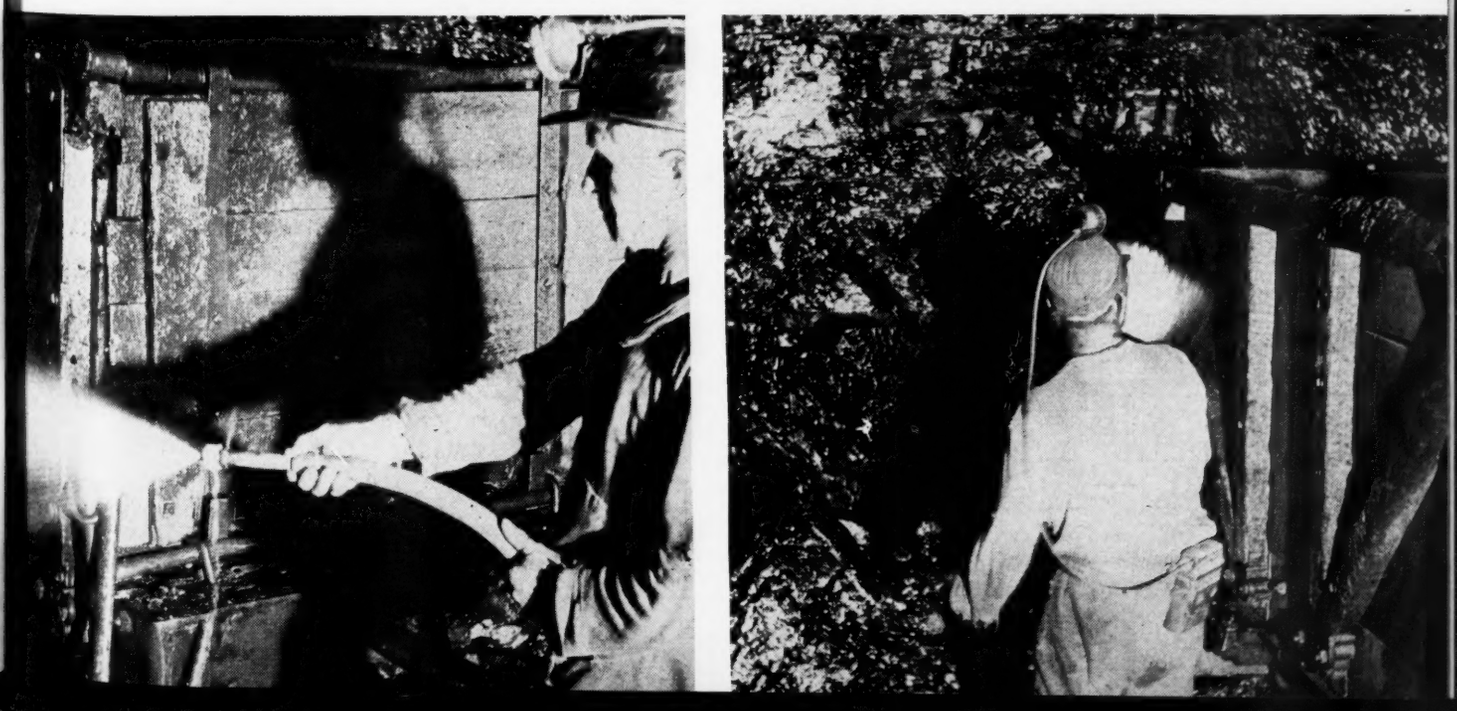
Dust Control

The suppression of air-borne dust in mines presents a complicated problem. Careful consideration must be given to the type of control equipment used, the points to be supplied from the equipment installed and the sources from which a constant supply of water can be secured. Also, laboratory apparatus is necessary to determine locations where control methods are required and to evaluate the final results to make certain, through water sprays of proper design, that the dust and gas volumes do not rise above safe limits.

Observations in the mines have shown that a rough but useful determination of the dustiness of the air can be made quickly by the use of a special electric cap lamp equipped with polished reflector. When the air-borne dust in the air surrounding such a lamp, which has been focused into a narrow beam, exceeds the accepted permissible limit of 50 million particles per cubic foot, it is readily shown in the light beam of the lamp. When less than 50 million particles per cubic foot are present, the air appears clear. This test is not effective when the ordinary cap lamp is used; a special lamp must be used.

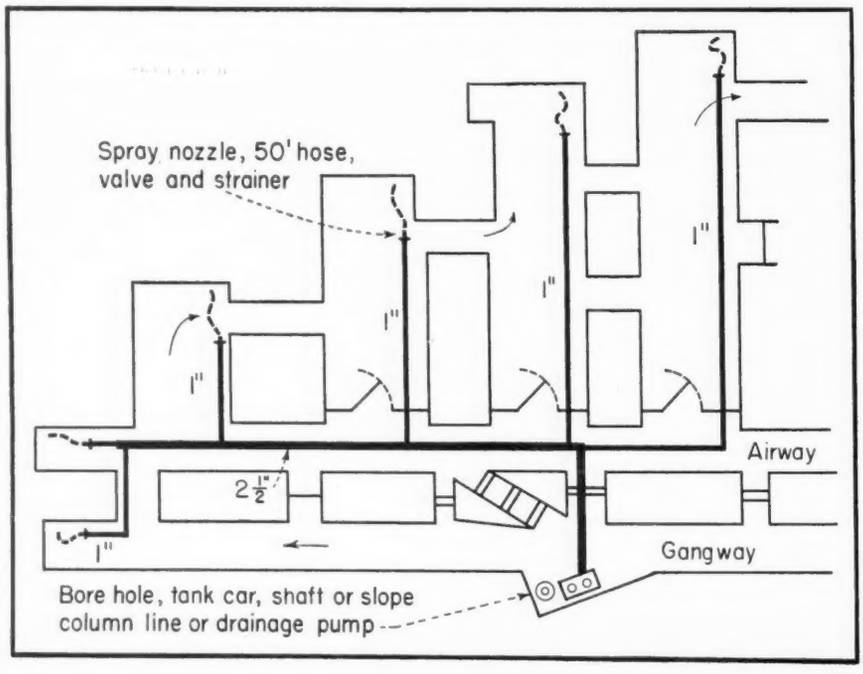
Drilling—Where holes for explosives are drilled with hand-operated drilling machines or augers, the rate of feed is so slow that the quantity of air-borne dust

Left—wetting coal with full-cone spray; right, loading coal after wetting. Note clear atmosphere.



Top—miner spraying coal at the face of a conveyor chamber; bottom, chain conveyor discharging wetted coal. Note clear atmosphere.

Standard method of supplying water to working faces with 2½-in. pipe "mains" (exaggerated in size in the drawing) on haulage roads and 1-in. pipe to chamber faces. Permanent system to be connected to column line, borehole, dam or other gravity water source with at least 40 lb. pressure. Compressed air introduced into water car on spur track.



produced is negligible. Where they are drilled by compressed-air-operated power drills, the resulting dust contamination of the area surrounding the driller has long been recognized as a major problem.

Until recently, the only recourse, except for expensive and massive wet-type tunnel-drilling machinery, was for the operators to wear filters or respirators. These are uncomfortable and while they give protection, the filters, having spaces enough to pass sufficient air, also pass some sizes of dust particles, and the protection therefore is not absolutely complete, although partially effective.

The modern compressed-air drill is equipped with simplified water attachments which force water through the drill steel and directly to the drill bit, practically eliminating dust at this source. Conversion from dry-type drilling to the improved wet type can be carried forward as rapidly as the equipment can be obtained.

Careful tests by dust-counting methods show the extreme effectiveness of the wet-type sinker in both coal and rock drilling, as a means of suppressing dust. Dust counts with these machines operated dry, and then operated wet, have been made repeatedly and show that invariably the use of the wet machine is adequate to reduce the dust-borne particles below the minimum that is held to be dangerous. Even in the blasting of coal the reduction is enormous when water sprays are used before blasting.

Undercutters—Where undercutters are used, a full-cone spray is mounted on the machine at the return side of the cutter bar with the control valve easily accessible to the operator. Experience has indicated that with the spray at this point very little dust is generated in the sumping-out cut. Inasmuch as the continuous water spray assists in maintaining a lower cutter-bit temperature, not only is the life of the bits extended but also the danger from a probable gas ignition is minimized.

Blasting—The blasting operation is obviously one where a large quantity of dust can be released, especially where multiple shotfiring is done, as in mechanized mining. Anything done toward diminishing these quantities is a step forward. A 3/16-in.-orifice full-cone spray nozzle is used to wet

the ribs, bottom and face before firing a blast and to wet the coal pile after firing and as needed during the loading-out period.

Contamination of the atmosphere is lessened and visibility is increased. This is of major importance in an area where many accidents occur while workmen are endeavoring to inspect the newly exposed roof.

Water Sources

Accumulations of water in the mines can be utilized when in the vicinity of dry active workings by conducting it through pipe of adequate size to dams and storage tanks or through boreholes to mining areas in lower veins. Acid mine water can be controlled to some degree by the use of lime as a neutralizing agent.

Experience and tests have indicated that approximately 3 gal. of water is needed per ton of coal mined. No wetting agent is necessary when full-cone spray nozzles are used.

Water is supplied to the coal faces under pressure by gravity from boreholes, with concrete dams and sumps located in higher veins; by gravity from shaft column lines; by mechanical pressure from air and electric pumps in the area; and by introducing air pressure into portable tank cars or stationary receivers.

Piping—The main links should consist of 2- or 2½-in. pipe with 1-in. pipe to the working faces. A 50-ft. length of ¾-in. hose serves the face and is provided with a spray nozzle capable of delivering a full-cone spray, the nozzle having a 3/16-in. orifice which provides 5 gal. of water per minute at a 45-lb. pressure. A valve and strainer should be installed at the end of the pipe to which the hose is attached.

It has been found that three nozzle sizes are adaptable for all phases where dust control measures were necessary. Most full-cone spray nozzles produce fair results at a pressure of 15 lb. per square inch, good results at 30 lb. and excellent results at 45 lb. and higher.

Since much of the water used for spraying comes from underground sources, metal nozzles were found to give short service because of the high acid content of the water in conjunction with high velocities through the nozzle orifice. One anthracite company has developed a plastic nozzle in three sizes that effectively reduces the dust concentration to within safe limits in all of the varied operations.

Top—front view of undercutter showing location of spray on return side of cutter bar; bottom, rear view of undercutter operated with spray. Note clear atmosphere.

Ventilation

The mining laws of Pennsylvania provide that a certain quantity of pure air must be furnished to each employee in the mine, and further qualify this by stating that such air must be in proportions large enough to "dilute, render harmless and sweep away smoke or dangerous gases." No mention is made of harmful dusts, but the modern mining industry is going a step further to insure that such air is free from high concentrations of harmful and nuisance dusts.

Increasing the quantity of air, particularly in low veins, serves only to increase the dustiness by energizing dust particles, which then become air-borne, and further

Mine Dust-Control Equipment

Wet-Type Pneumatic Drills

1. For all types of coal and rock holes to depths of 6 or 8 ft.; weight, 32 lb.; $165 dry; $180 wet.

2. For all types of coal and rock holes to depths of 6 or 8 ft.; weight, 35 lb.; $175 dry; $190 wet.

Self-Cleaning Water Strainers

Removal of rust, scale and foreign matter from water lines at the face prevents blocking of spray nozzles. Two types of self-cleaning strainers are:

1. With ¾-in.-thread cast-iron body containing a brass strainer 15/16 in. in diameter by 2⅜ in., which cleans itself when pipe plug is removed; $2.35 each.

2. With ¾-in. cast-bronze self-cleaning strainer, tubular brass casing and a brass flushing cock. A wire brush is furnished for cleaning out the strainer cylinder; $21.15 each.

Full-Cone Spray Nozzles

1. This ¾-in. bronze center-jet full-cone spray nozzle has a ¼-in. orifice that delivers a full-cone spray at a rate of 10 g.p.m. at a pressure of 40 lb. per square inch. About 3 gal. of water is needed for spraying each ton produced at the working face; $3.15 each.

2. This ¾-in. bakelite full-cone spray nozzle has a 3/16-in. spray orifice which delivers a full-cone spray at a rate of 5 g.p.m. at a pressure of 40 lb. per square inch. In numerous tests, this nozzle produced smaller spray particles than the bronze nozzle and was found to be more efficient in reducing dust concentrations. The plastic nozzle should be screwed on a standard ¾-in. pipe-thread adapter by hand, no wrench being necessary, slid inside the water hose and secured by a hose clamp. The bakelite nozzle is not injured by acid mine water, hot water or steam; 50c. each.

Tank Cars

Round, oval or rectangular steel tanks placed on mine-car trucks should be securely fastened down by steel encircling rods, straps or welded brackets. Provisions should be made for filling pipe and valve, water-discharge connection and valve and compressed-air connection and valve. If tank car is to be used by introducing compressed air into the tank, it should be inspected by a competent pressure-vessel or boiler inspector before being placed in service.

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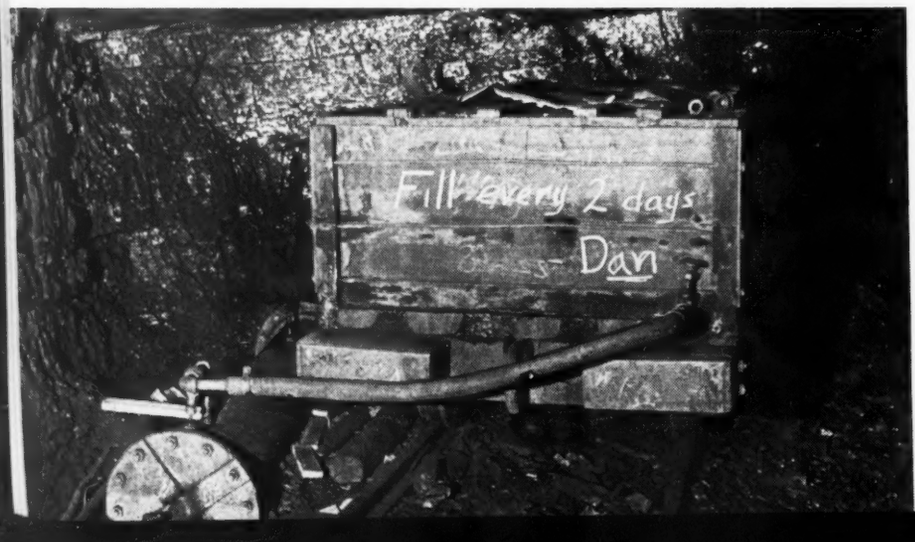
adds to the problem by speeding up the rate at which dust-laden air from one working place is carried to those adjoining.

Here again we can emphasize that the dust particle must be water-surrounded and knocked down as near its point of origin as possible. While it can be said that ventilation does little to control dust, it can be said conversely that dust control does much to aid ventilation.

The psychological aspect is that men working in a dust-free atmosphere seem conscious that an improvement in ventilation has been made. The physical aspect is that when water is applied to large piles of loose coal, such as are present in mechanized mining, the infiltration of water results in a much quicker liberation and absorption of occluded or trapped explosive fumes, carbon monoxide and oxides of nitrogen. Thus, these are picked up and diluted by the air currents instead of forming undetected pockets in the coalpile, to be later released in the workman's face while loading goes on.

In other words, noxious-gas dilution and dispersal is hastened without costly increase in ventilating volumes, speaking, of course, only of aerating loose piles and not of endeavoring to assist materially the normal ventilation necessary to sweep the solid coal face.

400-gal. wooden tank car fills pipe by gravity. Compressed air introduced into pipe furnishes pressure to put water to chamber faces.



Wetting Haulage Roads

After many experiments to determine the efficacy of spraying haulageways to allay spillage dust, it has been found that surface tension keeps the water sprayed from a moving tank car from having the desired effect. Wetting agents were added to the water to form a water-dust emulsion. This also proved unsatisfactory and uneconomical due to the rapid evaporation caused by the low humidity of intake air currents.

It was later observed that where a full dust-control program was in effect at the working faces very little, if any, dust resulted from the damp spillage in transit.

Conclusions

It can readily be seen that by proper control methods the dust counts can be kept at or below acceptable allowable limits.

To attempt to quote cost figures on a tonnage basis would be inconclusive because of the fact that the useful life of control equipment has not been established. Against the actual cost are the indeterminable profits resulting from an improved accident record as a result of increased visibility, increased production due to higher efficiency and better morale, and a probable lower labor turnover.

The presence of water lines at the faces also has additional value in the prevention of mine fires.

AIR BREAKER
Supplements Mansfield Strip Facilities

Shovel and Dragline Strip and Clean Out Around Coal Pillars—Lower Bed Prepared for Loading by Air Breaker —Correct Rope Choice and Proper Attention Lengthen Life and Promote Safety

By HERMAN WILBER
Foreman in Charge of Excavation, Jackson & Squire, Mansfield, Ark.

USING, among other stripping and loading equipment, an air-operated scissors-type coal breaker, we are working over an old slope operation in the Mansfield area of Arkansas where the overburden runs 37 to 40 ft. Arkansas coals are bituminous and semi-anthracite. More than 2,000,000 tons is mined each year and the reserve is estimated at 800,000,000 short tons. Ft. Smith is the industrial center of the State and the headquarters for Arkansas soft coal. The operating area is about 33 miles wide and 60 miles long and is shaped like an "L" with the base along the Oklahoma line. The beds range in thickness from 18 in. to around 8 ft.

The first real interest in mining in the State was in the late 80's, when the St. Louis & San Francisco Ry. extended its lines south to Ft. Smith. The range in heat value of the bituminous coal is from 11,000 to 14,000 B.t.u. per pound. Most Arkansas coals are brittle or friable and yield from 10 to 40 percent fine material. Arkansas sized coal is used extensively in the St. Louis district, where it meets smoke-ordinance requirements. Three different mining methods are used in the area: room-and-pillar, longwall and stripping.

The 37 to 40 ft. of overburden at our operation includes an 8-ft. red-shale top over blue shale extending down to the support pillars of smokeless coal left in the former slope operation. Stripping and loading equipment is as follows:

Marion 300 shovel with 8-cu.yd. dipper—general stripping.

Lima 2-cu.yd. dragline—top-of-bank work, primarily cleaning out between pillars.

Loading shovel, 1½-cu.yd., for placing the pillar coal in trucks in the pit, which is approximately 65 ft. wide. Where necessary, we use black pellet powder in 1½-in. holes 4 ft. apart for shooting the pillars.

Where the full overburden has to be removed, we shoot from the top. Holes 4 in. in diameter are drilled every 20 ft. with a Parmanco vertical drill. We use 65 to 70 lb. of 50-percent gelatin per hole. Safety regulations governing handling and shooting are observed to the letter.

Taking off the main overburden exposes the pillars, which are loaded after cleaning out between them with the dragline and shooting, if necessary. We then drop back and strip a 9-in. muck band, a 6-in. layer of coal and a second 9-in. muck band, which brings us to a 2-ft. coal layer also recovered.

Air-Operated Coal Breaker

For breaking this bottom 2-ft. layer of coal we have designed an air-operated coal breaker. We drill a 3½-in. hole through the 2-ft. vein, holes 3 ft. apart, and break back approximately two breaks from the face.

The breaker is fitted with a 10-in. diameter cylinder 12 in. long. The cylinder contains a piston with a 1½-in. shaft. Cylinder and piston, by means of suitable frames, are attached to a split bar. The two halves of the bar—the jaws—are fastened together midway with a ¾-in. bolt. The jaws and frames are of steel with a high nickel content. The jaws, when not spread in scissors fashion, have an over-all diameter of 3⅜-in., permitting them to fit easily into the 3½-in. drilled hole.

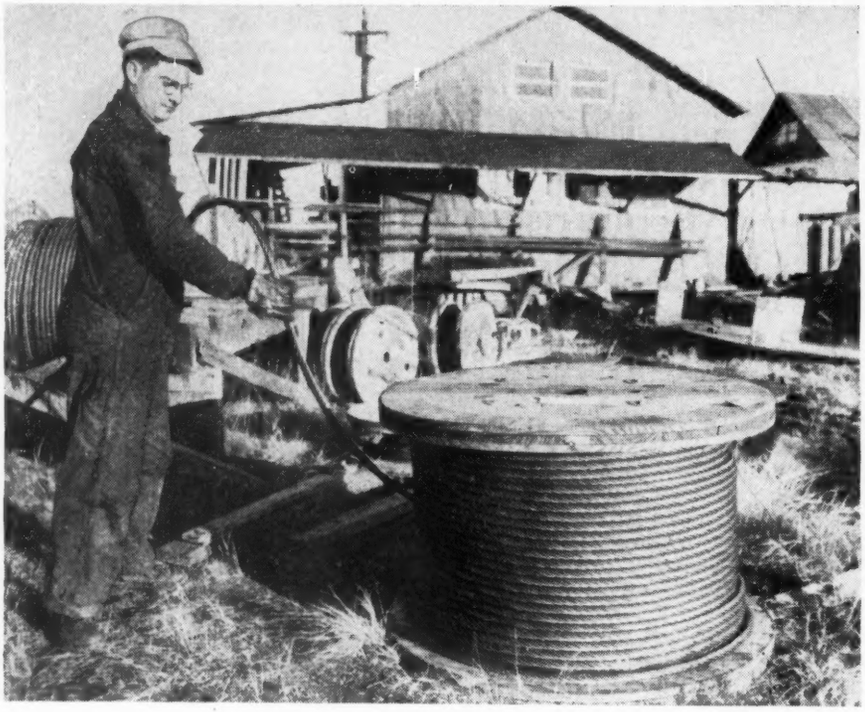
At the top, attached to a pipe leading to the piston, is the air hose.

The main overburden is handled by the 8-cu. yd. shovel.

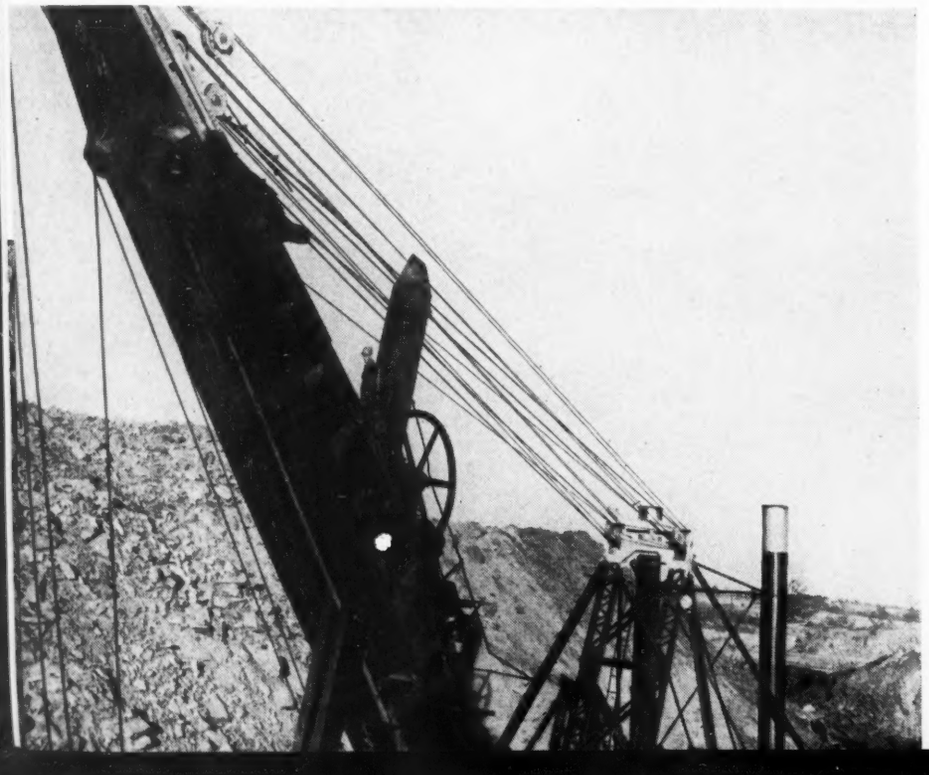
From 90 to 120 lb. of air pressure is used. The machine has a 2-ft. handle welded to each side of the frame and is operated by two men, one at each handle. The machine, complete, weighs 185 lb. Length of the jaws from the bottom of the frame to the lower end is 2 ft. 2 in.

The operators drop the closed jaws to the bottom of the 2-ft. vein, turn on the air, which opens the jaws scissors-fashion at the bottom and top, remove the machine and drag it to a second hole. We find this method far superior to shooting or the utilization of hydraulic jacks.

Two men with this air breaker will prepare approximately 600 tons of coal in an 8-hour day, all of which can be picked up and loaded into trucks with the 1½-yd. shovel. To shoot this coal would cost between 8 and 10c. per ton, or approximately $54 per 600 tons shot. The breaker also is much faster than a hydraulic jack, where the operator has to stop each time and adjust the jack. And, of course, there is the added safety angle that must be considered in any such operation.



The author checks the outside coils of new wire rope before it goes onto machine. Improved-plow-steel wire-center preformed rope is used.



On the boom in the center, operator inspects sheaves and wire rope and lubricates as necessary at the beginning of each eight-hour shift.

Safety Pays Dividends

The safety program and the maintenance program are so closely allied that it is hard to separate the savings or benefits derived, but the fewer the accidents the less the lay-up time for operators and equipment.

The Marion 300 shovel is fitted with 1,400 ft. of 1-in. improved-plow-steel boom line, two 140-ft. safety lines 1⅜-in.), two 140-ft. guide lines the same size and 300 ft. of 1⅜-in. hoist line. On the dragline we use 225 ft. of ¾-in. boom line, 140 ft. of 1-in. hoist line and a 70-ft. 1-in.-diameter drag rope.

If the proper wire rope is selected for the job and is given factory-recommended care, we find that safe life is greatly increased. Our 1,400 ft. boom rope will last 2½ to 3½ years. The 140-ft. safety lines will last an equal time. Depending on luck, we get from six to eight months on the 300-ft. hoist line, while the guide lines on the boom have practically no "wear-out."

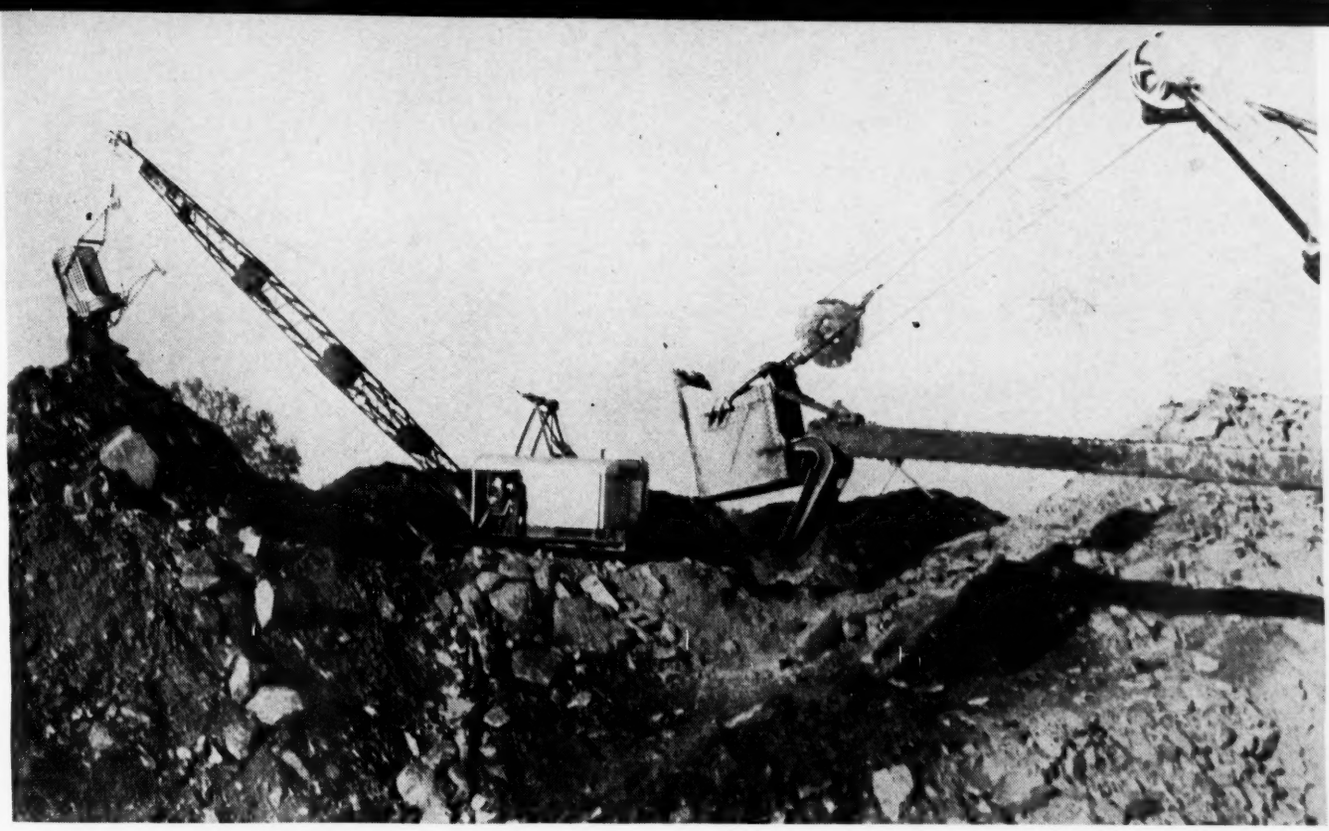
With proper care the boom line on the dragline will last two to three years. The 140-ft. hoist line will average three to four weeks and the 70-ft. 1-in. drag line is changed for safety every week or ten days.

We have found that it pays to use only improved-plow-steel preformed wire rope wherever possible. The preformed rope will not kink or whip. If worn, the outside broken wires hold their position and do not form barbs or snags. Also, in repairing and cutting back, there is a considerable saving in using the preformed type.

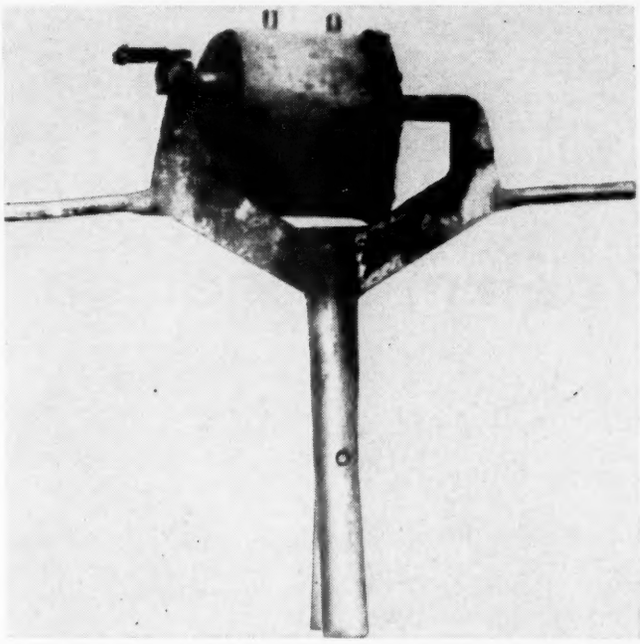
Inspection and Lubrication

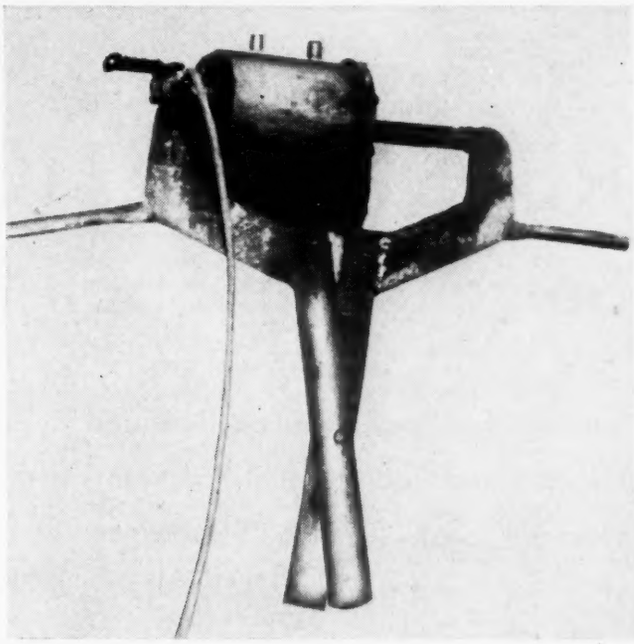
Both the big shovel and the dragline are inspected at the beginning of each shift. We are operating three shifts (24 hours a day) total. It takes approximately 25 min. to make these inspections and change shifts.

On the large shovel we have one foreman and seven men per shift, as follows: one operator, one oiler and inspector, one fireman, three ground men and one dozer operator.



The 2-cu.yd. dragline, normally used to clean out between pillars, is here being fed by the shovel.





Left—Air-operated coal breaker with scissor jaws closed. The breaker was designed and built especially for this work. Weight is 185 lb. Right—Breaker with air-line attached. Air pressure, 90 to 120 lb., operates the piston in the 10-in. cylinder, forcing the jaws apart in scissor fashion and thus breaking the 2-ft. coal vein. Two oil cups are shown at the top of the cylinder. The 2-ft. handles welded to each side of the frame permit easy two-man operation. Note the 3/4-in. bolt midway of the jaws.

We follow a regular factory-recommended schedule in inspection and lubrication. The 1,400-ft. boom line is thoroughly cleaned, inspected foot by foot and treated with a new dressing each 30 days of operation. The hoist line on the big shovel is inspected and lubricated at the drum weekly. On the dragline, the hoist line and the drag line are not lubricated. We tried this and for our type of work the life of the line is not increased enough to pay for the time required.

At each shift change, all sheaves are checked and, whenever possible, the lagging on the drums is checked. We have found that by following this policy we catch correction needs before the error damages the rope.

Fifty men are employed at the Mansfield operation, which is producing 750 to 1,000 tons of smokeless coal per 24 hours. The distribution is as follows: three stripping crews—seven men per crew, five mechanics (three welders and two straight mechanics), seven men at the tipple, a pit crew of ten, six drivers for the trucks and one superintendent.

Good fishing here. Planting on banks of lake, in Vigo County, Indiana, is 15 years old.

REFORESTATION
Solves Strip-Spoil Problem in Indiana

Pressure for Spoil Leveling Reduced by Success in Tree-Planting and Recreational Program Carried on by Operators — Cash Returns Strengthen Search for Better Crops and Better Planting Methods

By VANCE SAPPENFIELD
Linton "Daily Citizen," Linton, Ind.

STRIP operators in Indiana, as in other States, have been hearing howls for legislation to force leveling of spoil banks almost since the first horse-drawn slip-scraper removed overburden from coal for pick-and-shovel loading. This year, however, the howls have subsided to only an occasional mild yelp because of the long-range program of reforestation and reclamation carried on by members of the Indiana Coal Producers' Association and other far-sighted mine operators.

On the basis of available statistics, Indiana leads all States in the nation in number of trees planted on land mined by the opencut method. According to L. E. Sawyer, director of forestry and reclamation for the Indiana association, upwards of 21,000,000 trees have been planted since 1926, representing about 19,000 acres of planting. These 21,000,000 trees also represent an outlay of about $475,000 by members of the association, since the average cost of planting is $25 an acre. In Indiana members of the association have planted approximately 90 trees to every 10 placed in the ground by non-association members.

This program has had far from completely smooth sailing during its 20 years. In 1936, for example, 750,000 trees were lost because of dry weather and it was found that the black locust failed to thrive, except in isolated localities, because of repeated attacks by the black-locust borer. These failures are not to be wondered at, however, when it is remembered that in 1926, when the planting was begun, there were no precedents for reforestation of spoils. Conservation-minded officials of the association were strong in their belief that when the earth was turned over in the strip-mining process virgin soil would be brought to the top. The plantings proved that this soil, properly cured, was perfect for stimulating seedling growth.

It was not the danger of "level-

Scenery, too—small lake and spoil banks planted with evergreens in Pike County, Indiana

off" legislation alone that caused association leaders to decide on the reforestation work; there were several other factors. For one thing, raw spoil banks did not impress the operators as being exactly things of beauty. Another reason was that most of them were sportsmen at heart and they saw the foundation for a fisherman's paradise when lakes left by the strip shovels were stocked with fish.

The Indiana Coal Producers' Association has enjoyed unusually good relations with the Indiana State Department of Conservation in its tree-planting work. About 10 years ago the Central Indiana Coal Co. donated a plot of 1,358 acres of replanted mined-out land for use as the Greene-Sullivan State Forest. This area is becoming a stronger magnet for fisherman and recreation seekers from all parts of the State each year. It contains six lakes with a combined area of 25 acres. Three of them are 1.5 miles long and from 100 to 400 ft. in width.

In 1941, the Indiana legislature, with the cooperation of the association, approved a statute providing that all coal mines operating by the opencut method were to plant each year an acreage at least equal to that mined during the preceding year. The Indiana Farm Bureau and the Conservation Department assisted in drafting and passing the bill. The Department also assigns a forester to coordinate the tree-planting work. He sees that operators have the necessary permits and submit the proper maps and reports and that the required acreage is planted properly. This year all stock for planting came from State nurseries—the first time in history that they have been able to supply a sufficient number of trees. The association already has placed orders for seedlings through the year of 1950.

Full-Time Director Engaged

To make scientific studies of reforestation methods and to supervise the planting program, the association in 1938 secured the late Harry C. Hyatt, then city forester of the City of Cleveland, Ohio, as its director of reforestation and reclamation. Upon Mr. Hyatt's death, Mr. Sawyer came to the association from the U. S. Soil Conservation Service in 1944. He was then serving as chief of regional land management of the Service. Mr. Sawyer, after obtaining his degree in forestry from Michigan State College, was a member of the faculty of the University of Georgia for five years, was extension forester of the University of Illinois College of Agriculture for six years and was with the U. S. Department of Agriculture for nine years.

"In addition to the trees that are being planted," according to Mr. Sawyer, "nature has taken an active part in the revegetation of the mined-out areas. Extensive plots are covered with volunteer stands of cottonwood and sycamore, with smaller quantities of sweet gum, ash, black cherry, elm and some oak and hickory."

Land in Indiana adaptable to opencut mining usually was marginal or sub-marginal for agricultural crops and in many instances the land at present, after planting trees, is more valuable on the basis of future crop production (trees or grass) than before the strip-shovels began their work. The association, under the direction of Mr. Sawyer, is making experimental plantings to learn the best uses for the mined land. Selected plots have been planted with a variety of trees to learn which species flourishes best in the various sections of the State.

The process of using bulldozers to form pathways for cattle on top of strip hills has not been attempted in Indiana to any great extent as yet, Mr. Sawyer states. However, to test the value of stripped land for grazing crops, seven plots of widely separated sections of the State have been seeded with sweet clover, timothy, bluegrass and other grass mixtures. These seedings are in Clay, Vermillion, Sullivan, Warrick and Pike counties. Some of these plots already have been grazed profitably and the association is planning to seed more land for pasturage in addition to the 500 acres already planted. This year 118 acres is being sown.

Twenty-year-old volunteer growth on the banks of a strip-mine lake in northern Greene County, Indiana.

Young people enjoying the outdoors on a strip-mine lake in Vermillion County, Indiana. As the years pass, more and more Midwest residents use these lakes for boating, fishing, picnicking and other recreation.

In addition to the actual replanting work, the Indiana association has drawn attention to its reforestation by several other endeavors. At Linton, for instance, the Maumee Collieries Co. donated more than 400 acres of land to the city for use as a municipal park. Near Terre Haute, a tract of 110 acres was donated to the American Legion Post for use as a recreation center.

Already the program of reforestation has started to pay dividends. For eight years black locusts have been cut for fence posts and this year the first major return was obtained when a carload of pulpwood was sold to an Ohio company. This pulpwood was cut from the Greene-Sullivan State Forest.

The association also is cooperating with Purdue University's School of Agriculture and Extension Division by maintaining a graduate fellowship at the university. Methods of planting are being studied and best grasses for seeding of mined-over areas are being sought in a research program. The association, in addition, is cooperating with the Central States Forest Experiment Station, which represents the Research Branch of the U. S. Forest Service.

Proof that the subsiding of the "howls" about "level-off" legislation has not caused any cessation of planting activities of the association is contained in a report of the past two years of planting by that organization. In 1946, a total of 2,613,000 trees were placed in the ground and in 1947 association members planted 2,412,000. According to Mr. Sawyer, "the jack, Virginia and pitch pines have proved themselves the outstanding conifers in Indiana planting, in that order. All these have made extremely rapid growth."

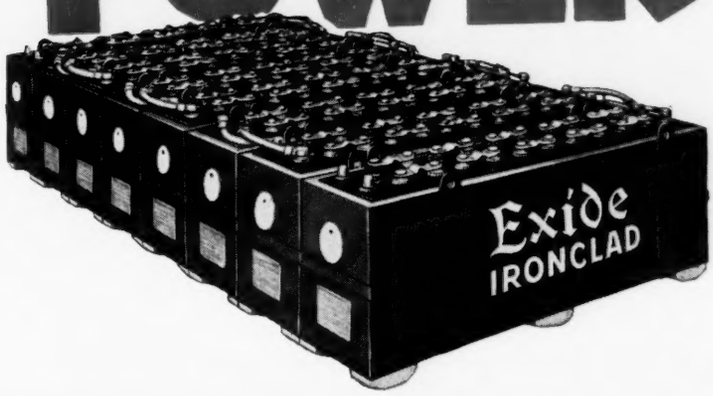
In the older plantings, the trees range in diameter from 3 to 6 in., on an average, with some as much as 10 in. thick. Height is 35 to 40 ft. The Scotch pine, although it has survived in large numbers, was not found to be a good species for future use because of the poor quality of wood produced and because it is susceptible to injury by sap-suckers, Mr. Sawyer said. It is, therefore, no longer being planted.

The enthusiasm of members of the association is being shared by many residents of areas where the planting has been conducted. In practically all instances, after the spoils have been planted local conservation clubs and Izaak Walton Leagues have taken over the task of stocking the lakes with fish and myriads of lakes have been thrown open to public fishing. The association is on record as welcoming any legislation that will free members from liability when the land is used by the public. If this legislation is approved, vast additional lake areas will be open to sportsmen.

Use of the lakes by sportsmen has probably done as much to quiet agitation for "level-off" laws as has the reforestation work itself. Each fisherman who finds good sport in the stripper lakes immediately becomes a staunch advocate of the land-use program of the association. In fact, association members have noticed that where there are more lakes suitable for fishing, the "howling" is much less than elsewhere in the State.

Disregarding the always-present attacks on strip mining because of the spoil banks, association leaders feel more than a little satisfaction from knowing that the land, after being mined and replanted, is now more beautiful than it was in its original state. And they feel certain that from timber, from pasture land and from the man-made recreation centers afforded by the planted areas, their investment in "poems of nature"—the trees—also will pay off strictly as a dollars-and-cents proposition in the future.

SAFE POWER



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The Foremen's Forum

Successful Mechanical Loading Requires Attention to Fundamentals

By HARRY NORTHOVER
Washington, Pa.

Guides to Success in Mechanical Loading

Understanding of what the machine can and cannot do and how to make it work most efficiently.
Coal properly prepared for loading.
No waiting on cars.
System in getting the work done.
Enthusiastic cooperation of the entire organization.

No loading machine should fail to give satisfactory results provided the conditions under which it works are for the most part suitable. Mechanical loading has been practiced intensively for a number of years under all kinds of conditions and from this experience has emerged an understanding of the requisites for successful operation of machines.

Certain fundamentals have been established and, about combinations of these, techniques can be developed for every set of conditions where mechanical loading is practicable. It is significant that where mechanical loaders yield large tonnages these fundamentals are closely adhered to —and that where machines make mediocre showings these fundamentals are grossly neglected.

The pioneering days in this field are over. It is no longer necessary for management to feel its way into mechanical loading. Knowing the fundamentals and applying them wisely, any management can make a fairly good go of it right from the start. The elements of procedure once having been established, performance will improve with practice. It is the intention here to consider some of the fundamentals of good practice and at the same time point out some of the pitfalls that have caused many of the failures. Strictly, the fundamentals fall into two classes: (1) those more particularly associated with management and (2) those more a part of the plan of operation.

To begin: "What is a mechanical loader?" It is exactly what its name implies—a machine for loading coal. The machine is designed for this purpose only and any violation of its proper use, such as attempts to make it dig coal, put needless strains on the mechanism. Improper functional application and consequent loss of time as a result of breakdowns therefore remove the machine from service and lessen its productivity as a loading agent.

This means that cutting, drilling and shooting must be executed so exactingly that the freed coal lies in much the same state at the face as when it is finally disposed in the railroad cars. No matter how involved the measures taken to achieve this end, they must be so taken.

A mechanical loader is a continuous-type machine and should be operated with as few interruptions as possible. Delays caused by moving cars to and from the machine represent a considerable part of the time lost. In going over time studies of loading machines operating under a wide range of conditions in different territories, the writer found that the average time lost waiting for trips was 11 percent of the shift.

Delays caused by inadequate preparation of coal for the loading machine mount up to large total in many instances. Again, a time study showed that over a period of 64 shifts the machine was idle 22 percent of the average shift because coal had not been properly prepared. This figure is unusually high, but it is not uncommon to find time losses for this reason running 5, 10 and 15 percent.

Mechanical loading calls for a high degree of science in management. The outcome usually is decided by the attitude of management in the earlier days of the undertaking. If management is lax or superficial in its methods, mechanical loading must surely fail.

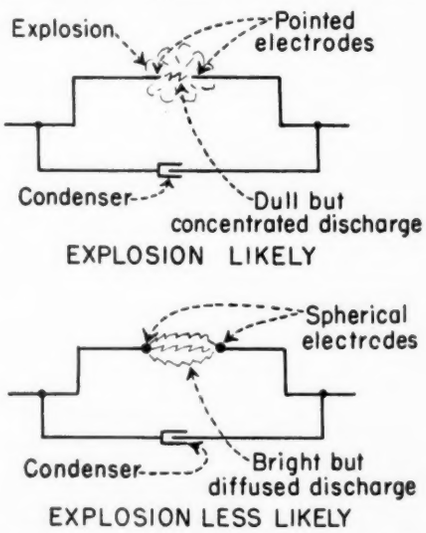
Orders and plans for doing the work must be set up in specific form and uncalled-for transgression of any of these must not be permitted. Those in charge of the work should spend most of their time on the job, since direct control and responsibility are prime necessities. Analytical thinking, resourcefulness, aggressiveness and initiative are far more necessary in mechanical loading, as compared to hand loading.

A stumbling block in progress in machine loading is the toleration, in any measure of managerial authority relative to the operation, of men who are not sympathetic. Sometimes, even when they do not openly voice their opposition, their interest is only passive, which is equivalent to condemnation through its effect on the morale of the organization. Success requires not only intelligent management of the immediate job but also the enthusiastic cooperation of the entire organization.

•

Electrostatic Sparks

It may be asked: "What electrostatic energy will ignite methane?" Unfortunately, the energy is not the determining factor. In "The Ignition of Firedamp" by H. W. Coward and R. V. Wheeler, Safety in Mines Research Board, Paper No. 53, p. 32, it is stated that "The necessity for an analysis of the character of a spark is proved by the fact that the total energy of a spark is not the determining factor in ignition (Paterson and Campbell, Proceedings Physical Society, 1919, Vol. 31, p. 168, "Electric Spark Ignition" London,



Top—with sharp electrodes, the spark will not spread. Such electrodes, therefore, favor methane ignition where the gap is short. Below—spherical electrodes spread the spark. Thus, the heat is spread, and methane may not be ignited.

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(2) constant cleaning action that keeps your engines clean, valves and rings free, oil holes and lines open;

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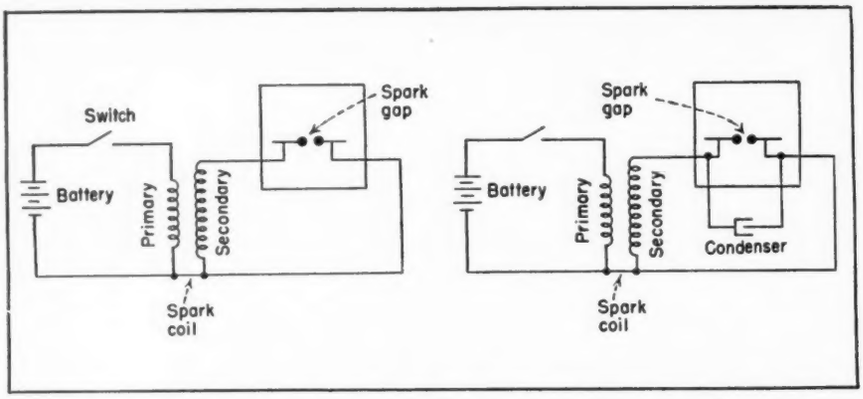


Hook-up without and with a condenser. When a condenser is incorporated in the circuit, the spark is less likely to fire methane than when the condenser is omitted. Yet the spark is much brighter when a condenser is provided than when it is absent.

1920, also Morgan and Wheeler, Journal of Chemical Society, 1921, Vol. 119, p. 239). Indeed, the minimum total energy of sparks of various types which will just ignite a given mixture of methane damp and air is very different from type to type.

Condenser Spark Is the Less Vicious—"A simple experiment described by Taylor-Jones (*Philosophical Magazine*, 1928, Vol. 6, p. 1090) illustrates this point. The discharge from a secondary coil, produced by a break in the primary circuit was passed through an explosive mixture of gases. In one experiment, a condenser was used in parallel with the spark gap; in a second experiment the only change was the omission of the condenser. Thus equal amounts of energy were discharged at the spark gap when equal currents were broken in the primary of the coil.

"When the gap between spherical electrodes was short, the spark obtained when the condenser was used was much feebler as a source of ignition, though much brighter than the spark obtained without the condenser. When the electrodes were pointed the spark was the more powerful. Hence, the total energy of a spark is by no means a measure of its igniting power.

"Morgan who had reached the same conclusion (*Journal of the Chemical Society*, 1919, Sec. 115, p. 94) suggested in explanation that the ignition is due only to the initial part of the spark, the capacity component. Hence, for sparks of equal total energy, the greater the fraction of their energy concentrated in the capacity component, the greater the incendivity of the spark.

"Taylor-Jones' observations with the short spark between spherical electrodes show, however, that this conclusion needs modification. This he has supplied from a photographic study of the sparks. The sparks of low brilliance but higher incendivity than the corresponding condenser sparks proved to be spread fan wise. Thus they provided, in accord with the thermal theory of ignition, means of raising and maintaining a greater volume of gas at its ignition temperature than were given by a single capacity spark. When the electrodes are sharply pointed, the spark cannot spread and, again in accord with the thermal theory, the condenser spark then becomes the better means of ignition."

One wonders, however, if concentration of the spark may not aid not only thermal ignition but also electrical ignition, provided ignition is electrical as well as thermal. At least one form of belt has incorporated in it conductive materials that prevent the charge from accumulating, because the charge bleeds off to the pulleys and thence to ground.

•

Coal Quiz-O-Gram

Because of space limitations, *Coal Age* was unable to present in the March issue all the report on the "Quiz-O-Gram" session at the annual meeting of the Coal Mining Institute of America. The remainder follows:

Qualifications for Service

Q.—Do you think, from your experience with modern mining methods, that the supervisor would be better fitted for his job if he had the advantage of a high-school education or its equal?

A.—A high school education is not always necessary, but it is difficult after one gets away from school to learn what high schools teach. A supervisor should have a knowledge of physics, mathematics and trigonometry. Thus, high-school training is helpful. One cannot make out a good report without education, though some men succeed somehow in qualifying themselves. (*W. J. Griffith*)

Q.—How can the United Mine Workers be "sold" on the benefits to employees of pre-employment medical examinations?

A.—The problem is what to do with the older employees. It must be carefully explained that the purpose is to find out if the person examined will fit in his proposed job and, if not, then to try to find a job for which he is fitted. Any company that now establishes pre-employment medical examinations will get only the floaters who have been rejected by those who have thus tested their applicants. (*W. J. Griffith*)

Industrial Health Problems

Q.—Do you recommend periodical medical examinations of employees? If so, how would they help the employee and how would management be benefited?

A.—Periodical medical examinations benefit the employee. If he has no defects, it is to his advantage to know it; if he has a small, remedial defect, it is surely of benefit for him to know that fact so that any imperfections can be corrected or checked by suitable treatment. (Answer by *Dr. D. C. Braun, medical director, Pittsburgh Coal Co.*)

Q.—Do you think it would be to the advantage of the prospective employee to submit to a blood test at the time of his pre-employment medical examination? How much delay would this test cause?

A.—It would be of positive advantage to have a blood count made. This would not take long. If a big company has to make ten per day, the delay would be no more than a day. (*Dr. Braun*)

Q.—Would you recommend periodical examination for men engaged in haulage and other occupations, where physical failure may endanger the lives of others?

A.—Yes. I believe in annual and semi-annual examinations. (*Dr. Braun*)

Q.—What jobs in and around coal mines are likely to injure the health of an employee unless respirators and proper ventilation are provided?

A.—All jobs are harmful with poor ventilation. Men often return too soon after firing of shots. I do not believe, however, that all the men in the mine should have respirators. (*Dr. Braun*)

•

Low Voltage May Be Hazardous

Resistance of the human skin is found to drop to as low as 500 ohms when the skin is moist. Skin is the body's main resistance to electrical shock. Precaution is suggested particularly under temperature and humidity conditions that result in perspiration. Under such conditions, frequent changing of clothing should be encouraged.

Frequently used arc-welding apparatus should have a large safety factor. Changing of electrodes should be done only when the circuit is deenergized.

—*Safety News*, West Virginia Coal & Coke Corp.

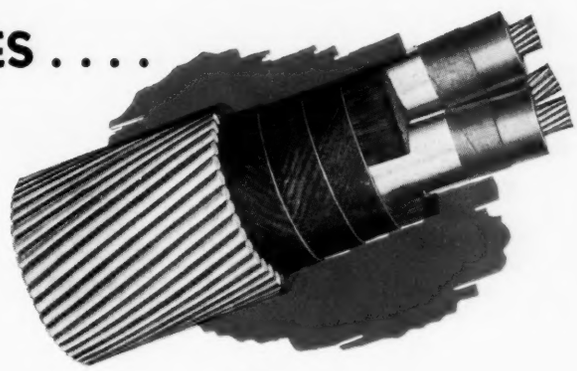
Cables for Greater MINING EFFICIENCY

Anhydrex MINE TELEPHONE CABLES....

ANHYDREX Mine Telephone Cables, either as flat twin or round, will very greatly increase your mine efficiency by enabling you to talk dependably with any part of your mine. Simplex-ANHYDREX Mine Telephone Cables combine the unusual properties of low water absorption insulation with a hard service neoprene jacket. This jacket will withstand usual mine hazards.

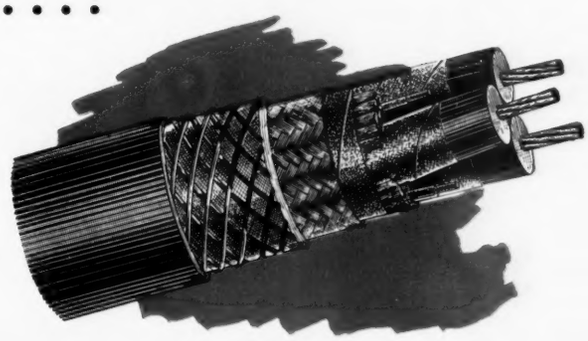
Simplex BORE HOLE CABLES....

Simplex cables for bore hole service can be designed having either rubber or varnished cambric insulation. They are usually protected and supported by steel armor wires. Simplex Bore Hole cables are custom made to fit the conditions where they are to be installed.



Tirex TRAILING CABLES.....

Simplex-TIREX Trailing cables increase the efficiency of strip mining service because they remain in service for much longer periods than would ordinarily be expected. The tough Selenium Neoprene Armor which protects all TIREX cables and the unique construction of TIREX cables combine to make a cable that has long life and gives trouble-free service under the most adverse conditions. TIREX Trailing cables can be made in a great many styles and types to suit the individual application.



At the Coal Show it is Booth No. 316.

Simplex Mining Cables

SIMPLEX WIRE & CABLE CO.
79 SIDNEY STREET
CAMBRIDGE 39, MASS.

Operating Ideas

Sheave Relined With Round-Rod Bands

Before the small bands were welded to the larger one. The fillet welds will give the groove a smooth contour.

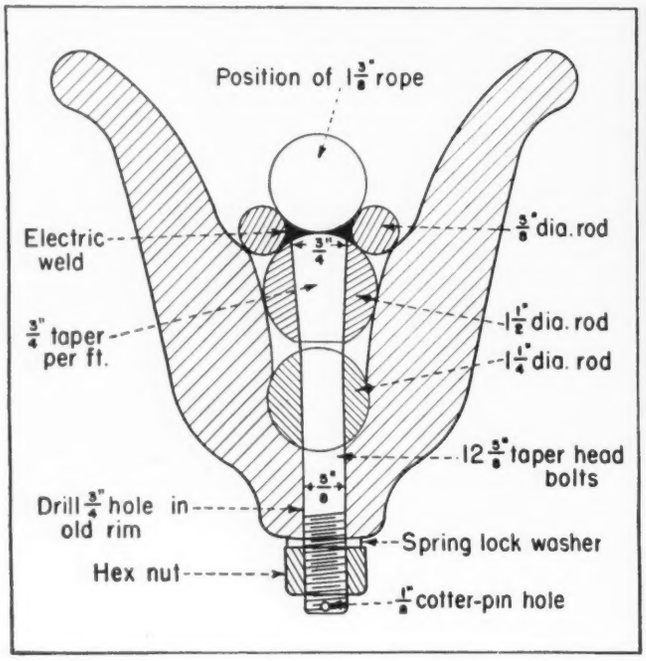
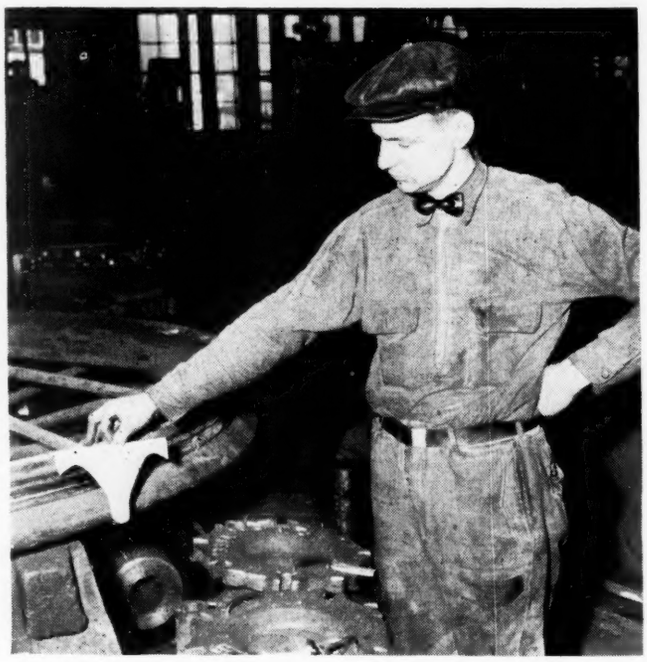


Fig. 1—How the various bands were fitted to the worn sheave.



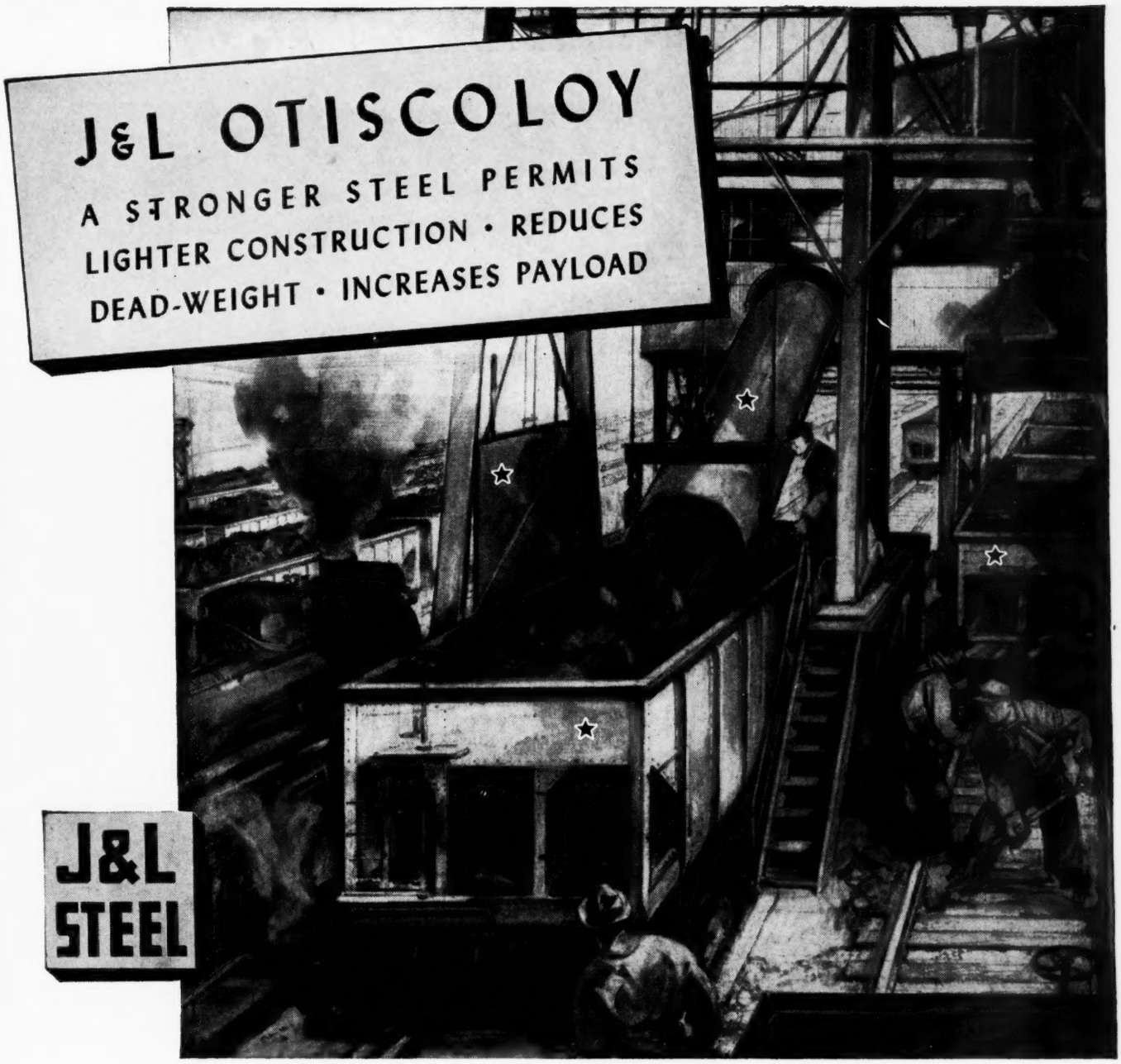
J. Nicholson, Jr., displays the template for the worn sheave wheel.

FITTING CIRCULAR BANDS from round, soft steel rods in the worn groove is a quick and satisfactory way of relining a sheave wheel, according to William Baskin, general foreman, Drifton (Pa.) shop, Lehigh Valley Coal Co.

The worn sheave, shown in the accompanying illustrations, required a 1¼-in., a 1½-in. and two ⅝-in. round-rod bands to provide a new groove for the 1⅜-in. rope. After making a template to fit the worn groove, bands of various diameters were selected to fill the worn groove and also provide the right-sized groove for the wire rope. In this instance, a 1¼-in. band was first placed on the 8-ft. sheave. While the band was held in place by clamps the gap in the ring was welded with an acetylene torch. The 1½-in. and two ⅝-in. bands were added in like fashion. It should be noted that none of the bands are welded to the cast-iron rim. However, both ⅝-in. bands are electric welded, along with their inside edge, to the 1½-in. band. Afterward, the 1¼- and 1½-in. bands are anchored in the groove by 12 long-taper bolts secured by nuts and cotter pins. After bolting, a ½-in. gap is cut with an acetylene torch in the newly applied bands at three equi-distant points around the rim, to permit expansion of the new bands. When the job is completed it looks as if three made-up segments had been bolted to the sheave.

Actually, said Mr. Baskin, we have bolted six steel-casting segments to a 10-ft. sheave with real success but it is much more expensive than the rod idea.

A sheave repaired in this manner, said Mr. Baskin, is suitable for use as an apex sheave for a slope, but is not recommended for use over a shaft where the additional weight might cause the soft steel bands to peen out.



Otiscoloy is 40% stronger than ordinary steel. Its high strength is obtained without mechanical working or heat-treating which permits great workability. Otiscoloy is also resistant to abrasion and corrosion.

★ Otiscoloy is used in freight cars to reduce weight by as much as 5½ tons per car. Also used in mine cars, trucks, barges, stripping shovels.

★ Otiscoloy used in coal chutes and backstops reduces wear by abrasion and atmospheric corrosion, and eliminates many costly repairs.

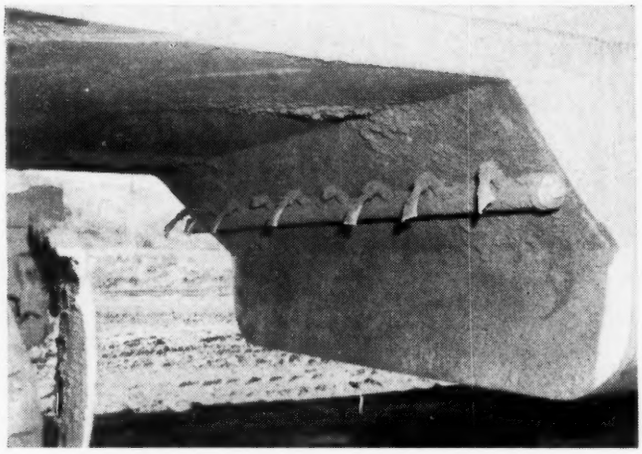
Write for Otiscoloy booklet.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

Water Truck Carries Pressure Pump

The 6,000-gal. water truck with pumping facilities is used for sprinkling the roads at Buckheart No. 17.



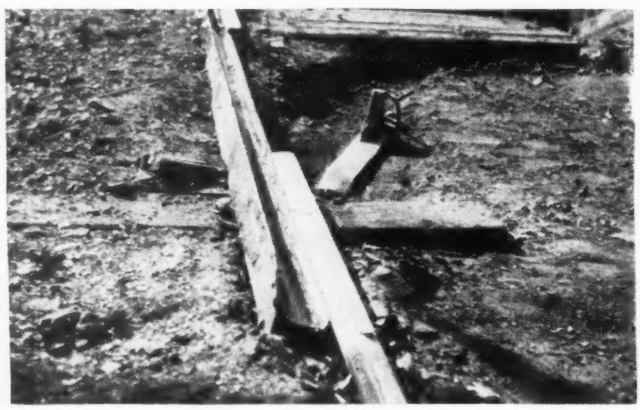
The seven spray nozzles are mounted back of the rear wheels of the tractor.

A SHOP-BUILT pressurized water truck finds year-round use at Buckheart Mine No. 17 of The United Electric Coal Companies, Canton, Ill., says E. B. Campbell, superintendent.

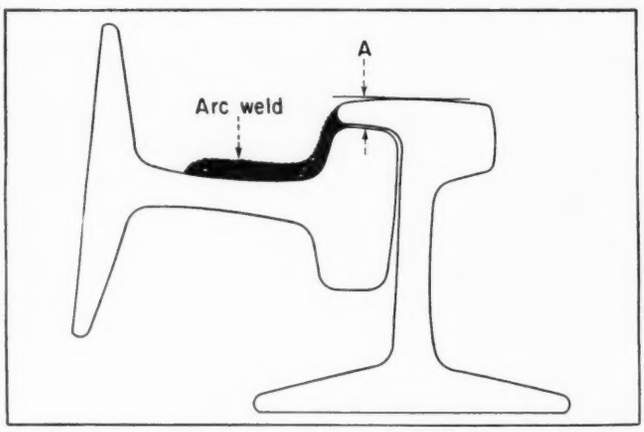
The 6,000-gal. tractor-trailer-type water truck, shown in the accompanying illustrations, is equipped with a 4-in. gasoline-powered pump for both filling the tank and for applying the water, under pressure, to the road. Seven nozzles direct the sprays on the road behind the rear wheels of the tractor. At Buckheart, it is necessary to spray the roads in winter, especially when there is no breeze. Thus, the truck operates winter and summer, being idle for only a day or two at a time.

The unit has performed so well that another was built for the same duty at a neighboring operation, the Cuba Mine.

Car Wheel Skids Topple Out At Rail Gap



As the loaded cars pass over the gap the skids topple out to the left without fail. Locomotive and car wheels cross the 4-ft. gap since their wheel flanges ride the web of the balled rail.



A few feet of the ends of the track rails are trimmed out by gas torch and the balled rail bridging the gap is then welded in.

EFFECTIVENESS, reliability and simplicity in construction are features of the track-rail arrangement for removing skids at the headhouse of the Gay Coal & Coke Co., Mt. Gay, Logan County, W. Va. The skids drop out from beneath the wheels of their own accord as the loaded cars approach the dump-bin trestle. A 4-ft. gap left in the track rail makes possible the drop-out. Locomotives and cars are enabled to cross the gap because their wheel flanges ride the web of a rail set sidewise (balled) and attached at its ends to the track rail.

As shown in the drawing, a part of the under side of the head of the track rail is cut out with a gas torch. The "balled" rail is then arc-welded to the track rail and the web filled to proper height for a runway for the wheel flange. The clearance "A" (see drawing) is sufficient to let the skids tip over sidewise and drop out. Now, the only labor connected with handling skids at the headhouse is that done by the brakeman in loading them into the empty trip as it starts back into the mine. From time to time it is necessary to add some metal by arc-welding where the flanges ride.

The underground main-haulage grade, in favor of the loads, is such that it has been found advisable to use four skids per 20-car trip. The rail weight is 40 lb.

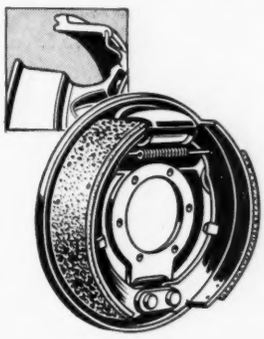
"THINK they last longer? Mister, I KNOW

FORD TRUCKS LAST LONGER!"

That's what Mr. R. G. Colvert of Ardmore, Oklahoma, wrote recently. "One of our Ford Trucks 11 years old," he added, "has gone over 250,000 miles and it's still on the job, with lots of good miles in it"

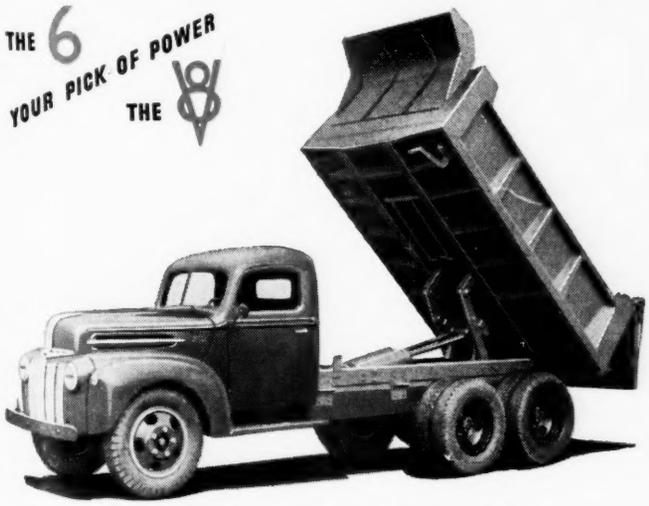
ONE big reason—FORD BRAKES STAND UP!

The wide, heavy, cast drum surfaces of Ford Brakes are non-warping and score-resistant. They are interlocked and fused with steel drum discs during casting, providing great strength and reducing weight. The two shoes are independently anchored, each shoe being actuated by its own hydraulic piston. Adjustment is extremely simple and entirely external. Brakes are exceptionally stable in adjustment. Entry of water and dust is minimized by closely fitted tongue-and-groove design, where edges of drums meet backing plates. Ford brake design promotes long lining life, consistent performance, extra-safe stopping ability and easy pedal pressure.



Ford

THE 6 YOUR PICK OF POWER THE V-8

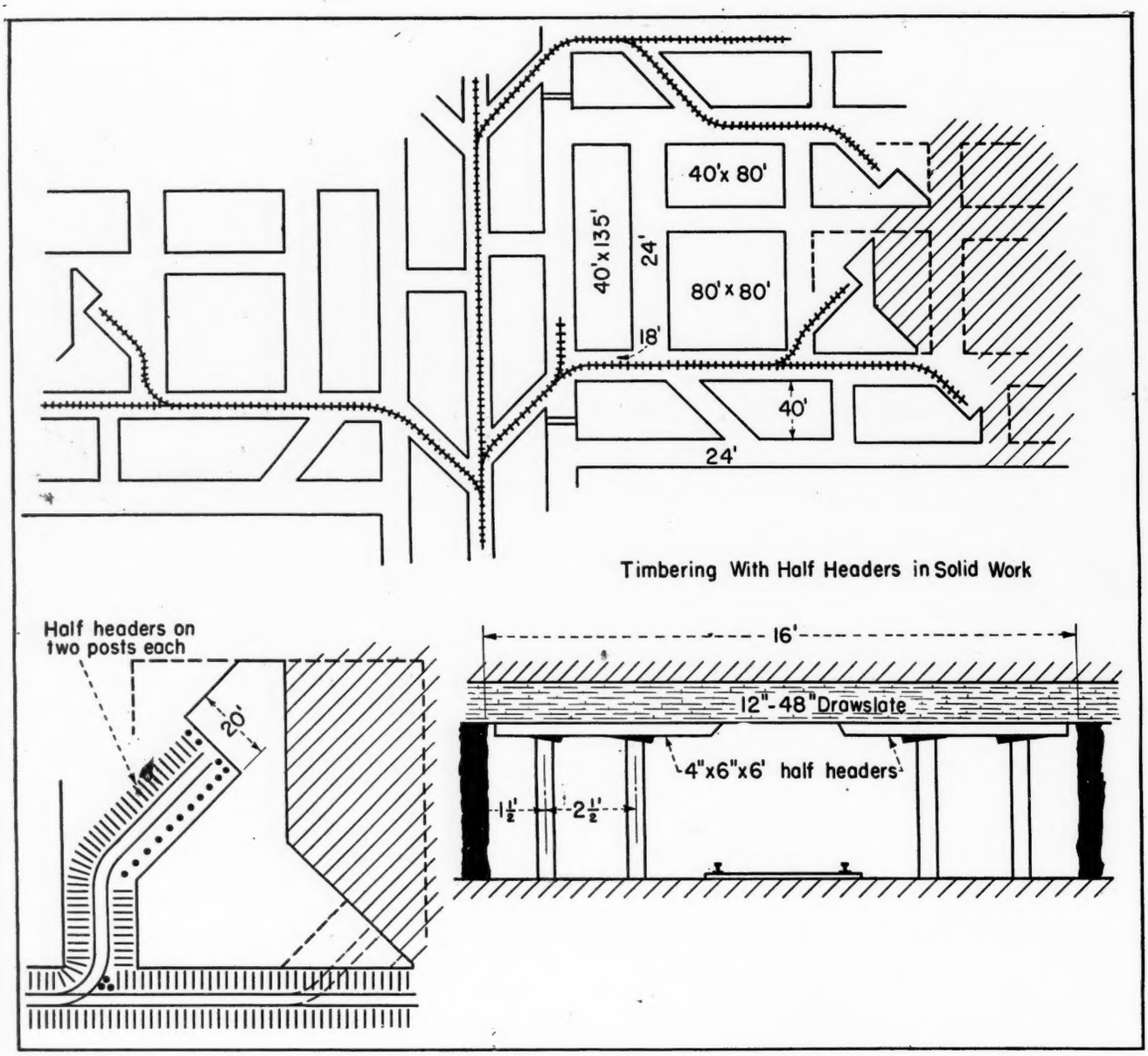


The Ford heavy duty chassis accommodates a wide variety of dump body and hoist equipment available through Ford Dealers. Here the 158" wheelbase Ford with Ford cab carries a 200-cubic-foot Coal Body and hoist by Gar Wood Industries, Inc., Detroit, Michigan.

ONLY FORD GIVES YOU *ALL* THESE LONG-LIFE FEATURES: Your pick of Power—the great V-8 or the brilliant Ford six—extra-strength frames, with siderails *doubled* in heavy duty models—new Flightlight, 4-ring, oil-saving pistons—full-floating and ¾-floating axles, with axle shafts free of weight-load . . . more than fifty such endurance-engineering features in all. It's because of this long-life construction that *of all trucks 14 years old or older on the road today, there are more Ford Trucks than all other makes combined!* More than 100 body-chassis combinations to choose from. Ask your Ford Dealer to show you!

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE!

Safety and Efficiency Cited for Pillar Plan



How square blocks are pillared from both sides on a 45-deg. angle and how half-header timbering is done.

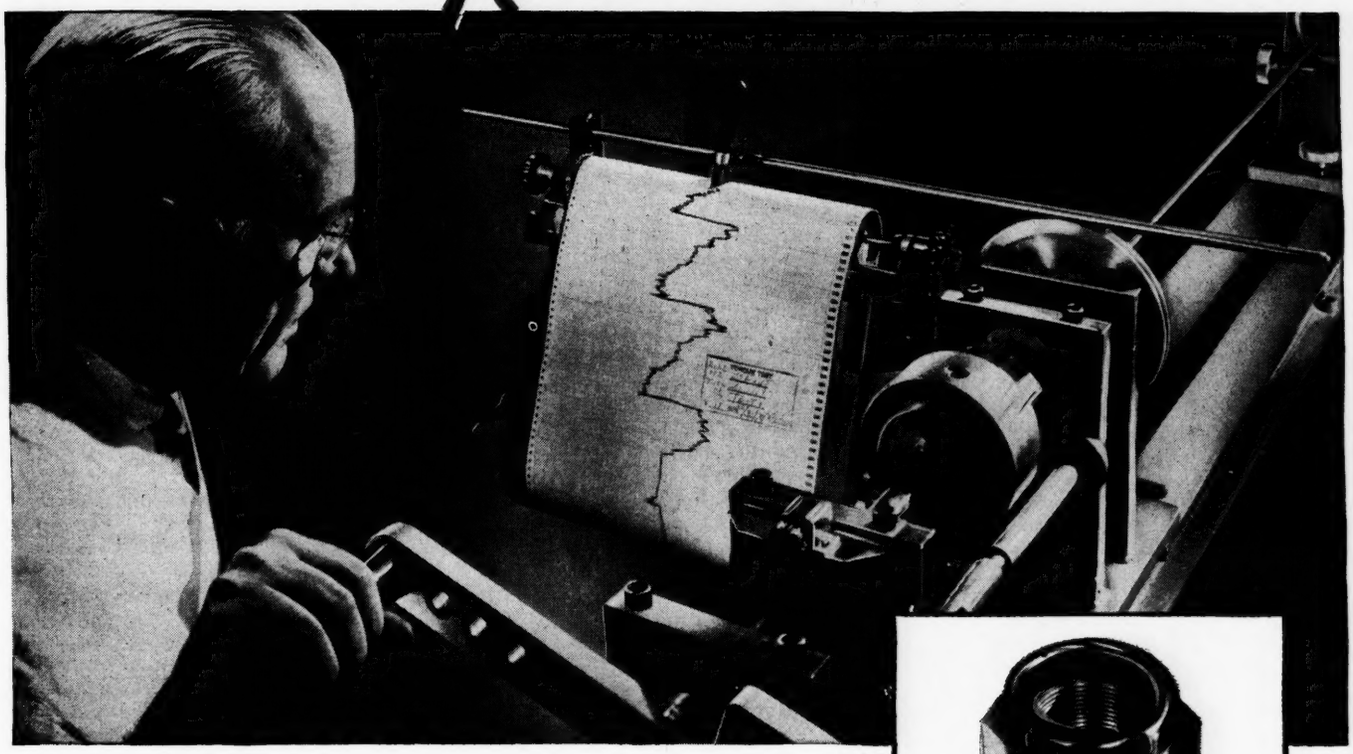
THE ACCOMPANYING SKETCHES are submitted by J. H. Justice, Raven, Va., to show pillaring and timbering methods he reports to be highly successful in several years of use. In pillaring, Mr. Justice says development should be arranged to leave 80-ft.-square blocks. To take out a block, 45-deg. open-end places 20 ft. wide are driven half-way across, starting on the gob side. When that side is worked down to the heading, the process is repeated on the other side. The remaining triangular stump is taken out in much the same way, starting at the back corner. Thus, Mr. Justice points out, no more than 40 ft. of track is exposed at any one time.

In many years of pillar mining, Mr. Justice states, he has never lost more than a few rails nor had a man hurt while recovering 95 percent of the coal. One of the secrets, he reports, is half-header timbering. Mr. Justice declares that it is good with any top and is especially valuable when the top is bad. In his operation, half headers are used on both sides of entry track and in room-and-pillar work up to the time pillaring starts. When pillars are removed, half headers (5x5 in. by 5 ft. or similar size), each on two posts, are set as close as 3 ft. on the gob side of the open-end places. Timbering in this fashion, he states, gives complete protection while driving open-ended 40 ft. or more. Safety posts are set as necessary on the rib side of the place and at the face for added safety.

Smoother Sailing!

Operating ideas, often born of necessity, make for smoother sailing at many operations. Frequently they become the keystone on which associated operations depend. Because of their importance, we invite you to send in some of the mechanical, electrical, operating or safety ideas you are using. If accepted, COAL AGE, upon publication will pay you $5 or more for each.

A-N TORQUE TESTS *Prove Reusability* OF ELASTIC STOP NUTS



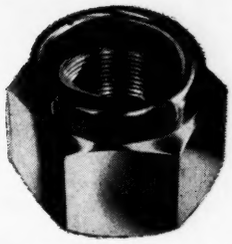
—*the Red Elastic Collar provides dependable locking torque for* RE-USE!

Army and Navy specifications for aircraft lock nuts include a specific torque test to prove locking effectiveness. Lock nuts have to maintain adequate locking torque through 15 on-and-off cycles.

ESNA Elastic Stop Nuts—with the Red Elastic Collar that has become a symbol of security to all aviation engineers—remain self-locking against Vibration, Impact and Stress Reversal in both pre-stressed and positioned settings.

In addition, the self-locking, self-sealing and reusable Red Elastic Collar protects the bolt. It does not deform the bolt, damage the threads or gall the finish.

Reusable ESNA Elastic Stop Nuts provide dependable protection against Vibration, Thread Corrosion, Thread Failure, and Liquid Seepage. This multiple protection—which has made Elastic Stop Nuts the standard fastener on many products—also achieves the double economy of inventory simplification and reduced procurement costs. ESNA engineers are now ready to study your fastener problems. Address: Elastic Stop Nut Corporation of America, Union, New Jersey. Sales Engineers and Distributors are conveniently located in many principal cities.



The RED ELASTIC COLLAR

— denoting an ESNA product —

. . . is threadless and dependably elastic. Every bolt—*regardless of commercial tolerances*—impresses (does not cut) its full thread contact in the Red Elastic Collar to fully grip the bolt threads. In addition, this threading action properly seats the metal threads—and eliminates all axial play between bolt and nut threads.

Torque tests—for Elastic Stop Nuts—are based on a steel-to-steel frictional coefficient of .18. Bolt loadings are figured at 40,000 psi for commercial bolts; 90,000 psi for aircraft bolts.

ELASTIC STOP NUTS

INTERNAL WRENCHING

ANCHOR

WING

SPLINE

CLINCH

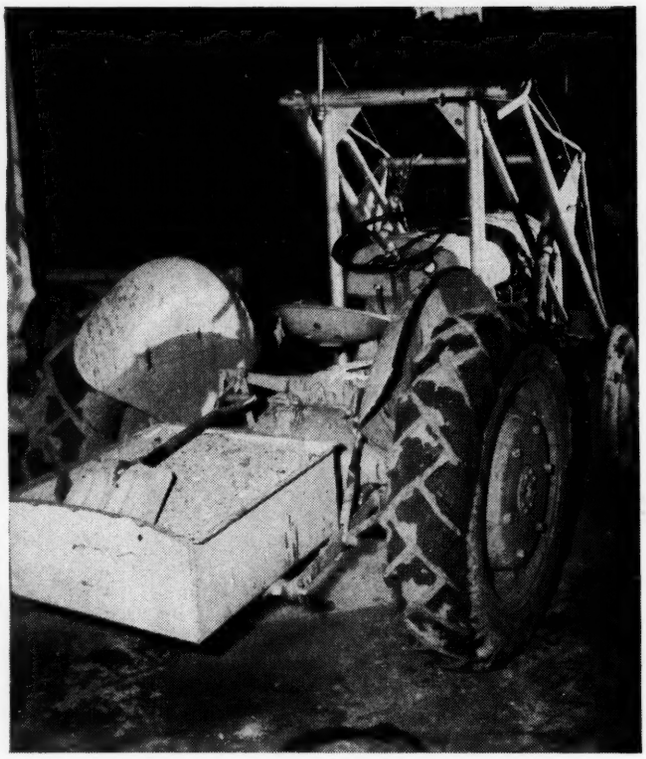
GANG CHANNEL

CAP

PRODUCTS OF: **ELASTIC STOP NUT CORPORATION OF AMERICA**

Rubber-Tired Tractor Performs Many Jobs

The tractor's scoop fits between the rails of a standard-gage track.



The unit is counter weighted with a box of crushed rock.

A RUBBER-TIRED TRACTOR with a front-end loader performs many jobs around the tipple and power plant, according to T. W. Pearson, general superintendent, Little Sister Mine, Little Sister Coal Corp., St. David, Fulton County, Ill.

The Ford tractor, shown in the accompanying illustrations, is equipped with Ferguson integrated equipment, including a front-end loader. The scoop fits between the rails of a standard-gage track and, therefore, is most useful in keeping the storage yard below the tipple clean. At the power plant, where power is developed for the mine and R.E.A. purposes, the tractor keeps the coal cleaned up around the truck-dumping station and also loads the ashes into a dump truck. The scoop is the right size for handling oil drums and is often put to this use.

In the strip pit, another Ford tractor, equipped with an angle blade, takes the place of one heavy bulldozer. It cleans up for the stripper and it does not appear to hurt the cable when crossing it. Ordinarily, two regulation bulldozers are needed in the pit, but much of the time their engines are running idle—too much idling is bad for a diesel engine. Also, extra maintenance is needed when bulldozers move around on coal, due to the added vibration. Thus, substituting the rubber-tired tractor for the heavy bulldozer represents a saving in capital investment and a reduction in maintenance. Furthermore, it is economical to replace them more often.

These Ford tractors are gasoline powered and the motors are stopped when the tractors are not being used. Anyone used to operating a car can operate this tractor. Two more of the tractors are used for moving pumps, cables, etc.

Filing Machine Holds 1,500 Cards

A WHEEL-TYPE filing machine facilitates the keeping of inventory records, says C. L. Maize, assistant supply clerk, Hubbard mine, Greensburg-Connellsville Coal & Coke Co., McKeesport, Alleghany County, Pa.

The Cardineer filing equipment, shown in the accompanying illustration, accommodates about 1,500 cards to a wheel. The wheel is divided into three sections, each section accommodating as many as 500 4x6-in. cards. Two of these filing units are used to keep a complete record of the stock in the storeroom at Hubbard. This equipment was supplied by Cardineer Diebold, Inc., Canton, Ohio.

C. L. Maize, assistant supply clerk at Hubbard, shows how convenient it is to use the filing unit on a desk.

FASTER, CLEANER DRILLING *with less* "FLIGHT DRAG"

...LMASTER SPIR-L-WELD AUGER

The smoothness of the flight surface *reduces resistance* in conveying borings from the drill head—and minimizes clogging. This smoothness, combined with the concavity of the Coalmaster flight surface, forces cuttings away from the flight-edge and reduces drag to a minimum. The result is *faster, cleaner drilling* with *decreased power demand* and *less strain.*

Only Coalmaster Augers offer the smoothness of conveying surface achieved by the exclusive Coalmaster Spir-L-Weld process.

DRILLING COALMASTER TOOLS

Order from your nearest Coalmaster distributor

- **Austin Powder Company** Cleveland, Ohio
- **Balimo, Ltd.** London, Eng.
- **British-American Industries, Ltd.** New York City, New York
- **The Buda Company** Harvey, Illinois
- **Diamond Supply Company, Inc.** Evansville, Indiana
- **Dooley Brothers** Peoria, Illinois
- **Illinois Powder Mfg. Co.** St. Louis, Missouri Denver, Colorado Salt Lake City, Utah
- **Joy Manufacturing Company** Main Office: Pittsburgh, Pa. Subsidiaries and representatives in 57 countries.
- **Salem Tool Company** Salem, Ohio

Coalmaster Special Alloy Steel Bits, **are heat treated for high strength wear and abrasion resistance. They are scientifically shaped and machined for faster, better cutting. Especially designed for exactness in drilling all bore hole sizes for underground and strip operations.**

Coalmaster Hexanspeed Assembly, **above right, is a fool-proof, automatic coupling that speeds up auger changing—and increases productive time at the bore hole.**

CENTRAL MINE EQUIPMENT COMPANY

ST. LOUIS 15, MO.

WILL THE SAME CONVEYOR BELTING HANDLE BARLEY, BRICK AND BRIMSTONE?

YOUR THERMOID DISTRIBUTOR WILL KNOW

The price you pay for conveyor belting should be based on the service conditions it must meet. To get the belting that's just right for your work, consult your Thermoid distributor. Tell him what is to be moved and he will be able to specify the most economical belting for the job.

He can also tell you—

That Thermoid conveyor and elevator belting is carefully built for the service each is recommended and sold for. He will be able to tell you that impressive records of trouble-free operation have been made by Thermoid beltings largely because each type is designed and made with a thorough understanding of the wear factors in the service specified.

He knows something about Thermoid too—

Thermoid concentrates its manufacturing for industry on the well integrated line as shown below. The Company itself, while large enough to be thoroughly reliable, is still small enough to keep active contact with customers and their problems. That's one of the reasons why—

IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID!

THE THERMOID LINE INCLUDES: INDUSTRIAL BRAKE LININGS AND FRICTION PRODUCTS • TRANSMISSION BELTING • F.H.P. AND MULTIPLE V-BELTS AND DRIVES • CONVEYOR BELTING • ELEVATOR BELTING • WRAPPED AND MOLDED HOSE.

A postcard or a letter to the factory will bring his name and address to you.

Manufacturers of new equipment are invited to correspond direct with the home office.

Thermoid
INDUSTRIAL RUBBER PRODUCTS
BUILT FOR THE JOB
QUALITY VALUE SERVICE

Thermoid Products

AUTOMOTIVE • INDUSTRIAL
OIL FIELD • TEXTILE

THERMOID COMPANY, TRENTON, N. J., U. S. A.

News Round-Up

Resumption of Negotiations Expected As Union Complies With Court Mandate

A call by Secretary of Interior Krug for the resumption of operator-union bituminous wage negotiations was believed imminent at the end of March, following John L. Lewis' cancellation March 19 of his Nov. 15th strike notice in compliance with the Supreme Court's earlier ruling. In a letter to the mine workers, Lewis quoted his 20-word cancellation letter to Krug and advised that his "instruction" of Dec. 7 continuing production until March 31 was "unconditionally" withdrawn and that the Krug-Lewis agreement was in full force until final determination of the basic issues. With a possibility of a stoppage March 31 eliminated, the industry, with the entire nation watching, focussed its efforts on a new contract and the early return of the mines to their owners.

Court Advances Order Date

Again ignoring its normal procedure for this case, the Supreme Court March 17 ordered issuance March 20 of its mandate requiring compliance within 5 days by Lewis and the U.M.W. with its rulings upholding the contempt convictions. Ordinarily the court's mandate is issued 25 days after a ruling, but as such a procedure would have meant its issuance on March 31, Lewis' deadline, Attorney General Clark March 8 asked the court to advance its mandate, an action which was opposed by the union. Failure to comply with the mandate would have subjected the U.M.W. to the full $3,500,000 fine levied by the district court and further possible contempt charges by the Supreme Court.

Charging that the Government was using a "blackjack" in favor of the bituminous operators, John L. Lewis provided the expected fireworks at his appearance March 8 before the Senate Committee on Labor and Public Welfare. In opposing amendment to the Wagner Act and the various labor bills under consideration, he declared that there was nothing that could be done to prevent nation-wide coal strikes unless the present form of government gave way to a totalitarian system. The only thing wrong with the industry, he said, was the ill treatment of the miners and that was a question between the operators and the miners, which they could settle if the Government would stop beating "the miners into submission while the operators take the profits." Labor hearings before both the House and Senate committees were concluded during the month.

Centralia Aftermath

- **Lewis March 29 decries six-day stoppage April 1-6, in mourning for dead. Production loss estimated at 8,000,000 tons.**
- **Some U.M.W. district leaders intimate miners may refuse to return to work in unsafe mines.**
- **U.M.W. reported considering claims against government for Centralia fatalities and others occurring since U. S. seizure. Lewis holds Krug responsible for deaths.**
- **Robert M. Medill resigns as director of Illinois department of mines and minerals April 1.**
- **Senate, state and other investigations into disaster pushed. Bill for federal police power over mines introduced into House.**
- **Krug April 3 closes as unsafe 518 mines producing an estimated 26 percent of the nation's bituminous coal.**

Foremen Unionization Approved

In a decision of primary importance on the foremen unionization question, the Supreme Court ruled March 10, by a 5 to 4 vote, that the employers must bargain with foremen's unions. In ruling on the Packard Motor Car's appeal from a NLRB decision, the court said that while the foreman was the faithful representative of the employer in maintaining production schedules, his interests regarding his own wages and working conditions may be adverse to those of the employer and that there is nothing in the Wagner Act that forbids the protection of the act to those foremen who take collective action. The court said that the Packard company, while conceding that foremen had the right to organize, denied that the Wagner Act compelled it to recognize the union, but that no evidence in the act indicated to the court that Congress intended to deny the benefits to them as employees.

The court made no distinction between independent unions and those which are affiliated with rank-and-file workers, a point which apparently will have to be settled by the Jones & Laughlin case now in the courts unless Congress clarifies it in the forthcoming labor legislation, as has been strongly advocated by industry leaders.

On the portal pay legislation, the Senate March 21 passed a bill that provided a two-year statute of limitations as against the one-year called for by the Gwynne bill passed by the House Feb. 28. Differences in the two bills were scheduled to be ironed out at conferences between the two groups. A measure providing for the construction of the St. Lawrence Seaway, identical with that previously offered by Rep. Kilburn (R., N. Y.), was introduced into the House by Rep. Blatnik (D., Minn.) While he asked for early consideration of the bill at this session, pressure of tax, labor and other legislation is expected to preclude any immediate consideration.

Fox Mine Return Stayed

Ralph A. Fox's fight to force the Goverment to return his operation seized last Jan. 6 continued in the courts last month. The return of the mine, as ordered Mar. 7 by the Federal District Court for the Northern District of West Virginia, was stayed March 14 by the U. S. Fourth Circuit Court of Appeals at Richmond, Va., pending argument April 8 and final determination of an appeal entered by the Government. The district court's injunction, according to the appeal, "interferes with the sovereign functions of the United States" and will "obstruct the performance of legal duties" called for under the act covering the seizure and operation of the company. The district court had held that the Coal Mines Administrator had no authority to take over the company because of its failure to comply with the terms of the Krug-Lewis agreement and that the suit was not against the Government itself. The company had contended that the seizure was a confiscation of private property without due process of law and that it was not a party to

the Krug-Lewis pact because there was no union contract and therefore no seizure.

•

Illinois Explosion Takes High Toll

At the end of two days' work, rescue teams had recovered 62 bodies and were still searching for 49 more miners believed dead, following an explosion March 25 that rocked the entire workings of Mine No. 5, Centralia Coal Co., Centralia, Ill. Only 31 of the 142 miners thought underground at the time survived what was believed to be one of the worst mine disasters in many years, and no hope was held for the 49 men still missing.

The explosion, the cause of which is still undetermined, came shortly before the end of the shift and spread throughout the 3½-mile workings, 540 ft. underground, with such force that the hoist was temporarily put out of commission. Progress of rescue workers was hampered by heavy gas concentrations and the necessity for closing off entries from the main haulageway to facilitate air travel.

The Senate March 26 voted an immediate inquiry into the disaster by its Public Lands Committee to determine if any public official were at fault. Representatives of the U.M.W. had previously charged Secretary of Interior Krug with negligence in ignoring the inspections and recommendations of Federal mine inspectors last November. Another inspection had been made the previous Thursday, according to the U. S. Bureau of Mines, but a report on it had not yet been issued. Previous reports by State and Federal inspector alleged insufficient rock-dusting.

•

Illinois Supreme Court Voids 1943 Level Law

The 1943 Illinois State law requiring strip-mine operators to level land after mining coal was declared unconstitutional last month by the State Supreme Court in a ruling that upheld an injunction by a Cook County circuit court prohibiting the State mines and mineral department from enforcing the act. Agreeing with the Northern Illinois Coal Co. and 16 other operators, who instituted the action, that the law was an unreasonable exercise of the State's police power, the court said the State had no authority "under the guise of a conservation theory to compel a private owner, at his own expense, to convert his property to what it considers a higher or better use." The operators had contended that almost all strippers in the State were already engaged in a long-range reclamation program that would make the land more valuable than leveling and that the cost of leveling would be prohibitive.

Pittsburgh Consol. Announces Program To Make Oil and Gas From Coal

Plans for a research and development program, designed to perfect commercial processes for making gasoline and a gas fuel of high-heat value from bituminous coal, which it is believed will lead to the creation of a new multi-million-dollar fuel industry, were announced March 25 by Pittsburgh Consolidation Coal Co. Immediate construction and operation of a pilot plant to work out the process is expected to pave the way for a commercial gasification and liquification plant costing as much as $120,000,000 by 1950-51.

In outlining plans, George H. Love, president, said: "A program of this magnitude requires careful analysis and long-range planning of the major steps involved. It can be said that step No. 1 has been taken. This covered the original survey and the fundamental laboratory studies and blueprinting of a pilot plant.

"The second step, which we are about to take at this time, is the construction of the pilot plant. Following a year or more of experimental operation of the small-scale plant will come the preparation of plans for financing the large commercial project. This might be done as a joint undertaking by industries closely interested in such an operation, or through some form of public financing. The final step would be the construction and eventual operation of the commercial plant."

The revolutionary program is being pushed in collaboration with the Standard Oil Development Co., central technical organization of Standard Oil Co. (New Jersey), which has an extensive background of research on this and related subjects. Arrangements have also been made to contribute to the studies of Hydrocarbon Research, Inc., headed by P. C. Keith, which also is engaged in similar research.

Pilot-Plant Capacity 50 Tons

Joseph Pursglove, Jr., vice president in charge of research and development, explained that the pilot plant, to be erected at Library, Pa., the company's new research center, will be of "demonstration size" and will be used to perfect and commercialize processes already under development on a laboratory scale. "We estimate its cost at $300,000," he said. "The pilot plant will consume about 50 tons of coal a day, from which will come a daily production of about 2,400,000 cu. ft. of gas suitable for synthesis into liquid fuels and into a gas fuel of high-heat value.

"A commercial plant for making liquid fuels and a high B.t.u. gas, which we hope might be ready for operation by 1950-1951, could be located within some 25 miles of Pittsburgh, adjacent to one of the company's huge coal tracts. One single large plant of the size being considered could yield a gas of high-heat value equal to the output of the Big Inch and Little Inch pipelines and create a local source of gasoline, diesel and other fuel oils and some alcohols."

Such a plant would consume about 20,000 tons of coal a day. Employment would thus be provided for about 2,000 coal miners, about 2,000 persons to operate the plant and at least 2,000 other people to supply material, equipment and supplies.

Mr. Pursglove pointed out that in addition to creating these steady jobs the plant would "develop approximately $40,000,000 added annual purchasing power for the regional area, whereas pipelines bringing gas fuel from other areas create practically no jobs nor purchasing power there.

"Getting coal into a form that people want to use is a job of very special importance to the Pittsburgh industrial area, since this region is both close to large unused reserves of coal and in need of a large increase in the supply of gas fuel."

Competitive Position Improved

Mr. Pursglove pointed out that coal production in Western Pennsylvania has been declining, because the industry there "cannot compete successfully in many cases with coals from neighboring States, which can be mined more easily and at a lower cost. Apparently, one of the answers for continued coal production in Western Pennsylvania on any scale approaching past years is to take advantage of its location close to large consuming markets and large areas of dense population, by getting the coal into some form of energy that this large population can and will use locally."

A unique advantage of the projected conversion process is its flexibility. "It could be arranged," Mr. Pursglove reported, "to produce 400,000,000 cu. ft. of gas per day in the winter months and reduce this by half during the summer months, when the plant would be set up to produce larger quantities of gasoline. Such a plant would produce an estimated 14,000 bbl. of high-octane gasoline daily during the summer season, when consumption by motorists is highest. . . .

"Research and development problems of this magnitude are so expensive that no coal company in this country up to 1945 was willing or able to take on a job so big and naturally so speculative. Until the merger of Pittsburgh Coal and Con-

We extend a cordial invitation to you to visit us at Booth 528

PREPARATION PROBLEMS?

LET'S TALK IT OVER AT THE MINING CONGRESS!

Many bituminous operators, who employ the CHANCE SAND FLOTATION PROCESS in cleaning coals, have: 1. Reduced picking cost. 2. Cut loss in rejects. 3. Stepped up production. These are three of many savings realized by users of the CHANCE SAND FLOTATION PROCESS. These savings are just as possible with the Chance Process cleaning *your* coal.

THE HEART OF THE PREPARATION PLANT

United Engineers & Constructors Inc

NEW YORK 17 · PHILADELPHIA 5 · CHICAGO 2

solidation Coal took place this research project was too big to handle," Mr. Pursglove said.

"It was learned that Standard Oil Development Co. had progressed far enough with coal gasification to warrant studies in field plants. Much of this progress was based on Standard's development in the prewar period of the fluid technique of catalytic cracking of oil. Hence our arrangements for collaboration with them on this subject.

"The process consists of two basic steps," Mr. Pursglove stated. "First, the coal must be gasified, that is, made into carbon monoxide and hydrogen. This produces a 'synthesis gas,' or 'feed gas,' similar to the old water gas first produced in the nineteenth century. The two gases in the feed gas are combined in a hydrocarbon-synthesis plant, forming a certain proportion of liquid fuels and a certain amount of gas of high-heat value. While the feed gas contains only about 300 B.t.u. per cubic foot, a high-heat-value gas that can compete with natural gas has not yet been made from coal without first going through this synthesis conversion.

"The conversion of carbon monoxide into gas fuel of high B.t.u. value and into liquid fuels has been done in a large-scale plant of Standard Oil Development Co. at Baton Rouge, La., starting with natural gas, which first must be broken down into carbon monoxide and hydrogen.

"There are two large commercial plants now under construction, one in Brownsville, Texas, and the other in Western Kansas, for converting natural gas into gasoline. It is reported that each will produce about 7,000 bbl. of gasoline and liquid fuels daily, using between 80 and 100 million cubic feet of natural gas per day.

"It can thus be seen that the essential problem to be solved is the commercial working out of the first step of the process—that is, the gasification of coal into carbon monoxide and hydrogen."

Three Big Mines Necessary

Operation of a commercial plant large enough to produce 400,000,000 cu. ft. of gas per day would require the output of at least three large mines, such as the company's new Mathies mine. Since such a plant would use over 6,000,000 tons of coal yearly and because of the large capital investment involved, it is estimated that a reserve of at least 180,000,000 tons of coal should be available to assure operations for at least 30 years. Mr. Pursglove reports that the Pittsburgh Coal Co., an operating subsidiary, has two large tracts sufficient to support two such plants each. One location might center around Linden, Pa., eight miles southwest of Library, and another around Hickory or Menden, Pa. West Virginia and Eastern Ohio may also be considered as future plant sites because of the company's large coal reserves in those areas.

In such a plant coal quality will not be an important factor, since run-of-mine coal can be used, eliminating cleaning and screening. The high volatile coal of the Pittsburgh region should be very satisfactory.

The pilot plant is expected to be built the latter part of this year, with part of 1948 devoted to operating it and collecting essential data. Running parallel with the pilot-plant work, plans can go forward for the big plant, the company expects, so that by the latter part of 1948 and early 1949 plans for actual construction would be activated.

•

Boyd Appointment Disputed by Lewis

In two appearances before a Senate Public Lands subcommittee last month, John L. Lewis vigorously protested the appointment of Col. James R. Boyd, dean of faculty, Colorado School of Mines, as director of the U. S. Bureau of Mines, succeeding Dr. R. R. Sayers, who plans to return to the U. S. Public Health Service. Branding the choice as a "political deal," Lewis called Mr. Boyd unqualified and said the miners resent the appointment made "without asking the men who are going to die in the mines if they are satisfied." Later it was announced that President Truman had asked Dr. Sayers, who had planned to leave the Bureau April 1, to remain until relieved, and considerable doubt existed as to Mr. Boyd's confirmation by the Senate. Dr. Sayers came to the Bureau from the Health Service in 1940.

•

New Developments

• Consolidation Coal Co. (Ky.), Jenkins, Ky., has announced that it will soon place contracts and start work on the development of a new completely mechanized mine, with a planned capacity of 4,000 tons daily, in the area of the upper waters of the Rockhouse Creek, Letcher County, Ky. The Elkhorn No. 3 seam is to be mined and a complete washery and screening plant is to be erected. Both the Louisville & Nashville R. R. and the Chesapeake & Ohio R. R. are reported to be planning construction of connecting lines. Production from this area, it is understood, is expected to replace that from the company's Jenkins and McRoberts areas when those operations are necessarily reduced in the next five years.

• The Reppert Coal Co., Flemington, W. Va., is reportedly developing a new drift mine at Lumberport, Harrison County, W. Va., on the Baltimore & Ohio R. R. The mine, which will have a capacity of 2,000 tons per day, will tap the Pittsburgh seam. Stripping operations, which began there March 1, will be of limited duration, it is understood.

• A new stripping operation planned to produce 10,000 tons daily reportedly will start soon in Van Buren County, Tennessee. E. C. Brock Sr., of the Rocky River Co., Cookeville, Tenn., has announced that 20,000 acres of mountain land has been leased to the Miles Brother Coal Co., Cadiz, Ohio, for a period of 25 years. The Ohio company has begun assembly of a 3-yd. P & H dragline at Campaign.

Extensive prospecting and testing in the area over the past four months, the Ohio company reports, have revealed excellent prospects for a new field comparable to the best developed field in the South. The first mining operations will be 18 miles from Campaign and located between the two impact areas of the Artillery Range.

• P. & O. Construction Co., St. Clairsville, Ohio, is reported to be opening soon its No. 1 strip mine near Adena, Harrison County, Ohio. A daily capacity of 1,500 tons is planned, from the Ohio No. 8 seam, and the coal will be shipped on the Wheeling & Lake Erie R. R. G. S. Howard and LaMar Young, of Canfield, Ohio, are owners of the new operation.

• The Dexter strip mine, near Dexter City, Noble County, Ohio, is expected to be opened soon by the Testa Excavating Co., Cleveland, Ohio. The operation will produce 1,200 tons daily and will mine the Ohio No. 8 seam, shipping via the Pennsylvania R. R. Frank Testa is president and Dominic Testa is vice president of the company.

• The Pittsburgh, Ohio Valley & Cincinnati Ry. is understood to be acquiring options on right-of-way land in the Captina Valley for the extension of its Powhatan line westward to Armstrong, Ohio. The new line is expected to open up thousands of acres of Pittsburgh-vein coal lands.

• The Hanna Coal Co., St. Clairsville, Ohio, is reportedly planning construction of one of the biggest and most modern preparation plants in the world at its Piney Fork mine, with a sister plant at the Willow Grove mine under consideration for the future.

• Further details of plans for the new Muskingum Coal Co. mine (*Coal Age*, January, 1947, p. 102) have recently been announced. The new operation will be a slope entry into approximately 15,000 acres of lands in a tri-county area that includes parts of Harrison, Carroll and Tuscarawas Counties, Ohio. The No. 6 seam to be mined is said to vary from 36 to 50 in. in thickness. The company plans a daily production of 5,000 to 6,000 tons.

• Sale for $350,000 of the former Shawmut Mining Co. to the New Shawmut Mining Co. headed by A. J. Palumbo of St. Marys, Pa., was an-

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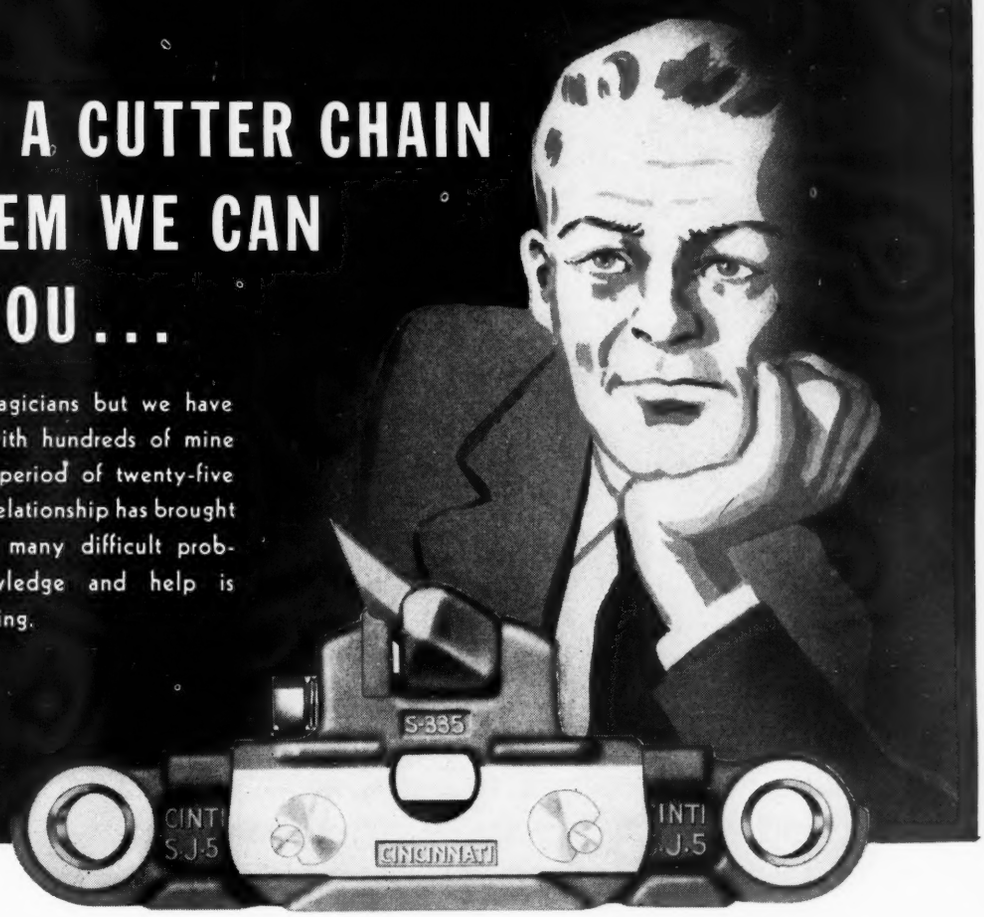

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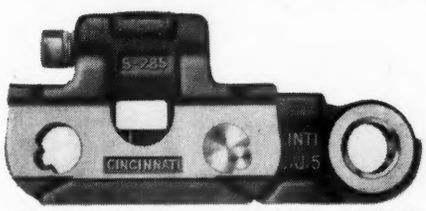

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YEARS ago we started out with one thought in mind . . . to build a better Cutter Chain. For twenty-five years we have devoted all our energies and engineering abilities to that one task. Today, Cincinnati Chains and reversible, double-ended Duplex Bits are acknowledged all over the world for their outstanding performance under any and all cutting conditions. Heat-treated and drop-forged, the Cincinnati Chain is engineered to give greater production at a lower cost . . . to hold shutdowns to a minimum . . . to produce larger cuttings . . . to use less power. Let one of our representatives prove to you the advantages of Cincinnati Time Tested Coal Cutting Equipment. There's no obligation.

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Type KSC Automatic Reclosing Circuit Breaker Bulletin 4411 is available by writing, now, to I-T-E Circuit Breaker Company, 19th and Hamilton Sts., Philadelphia 30, Pa.

Coal Activity

Bituminous Coal Stocks

	Thousands Net Tons Feb. 1, 1947	P.c. change From Jan. 1, 1947	P.c. change From Feb. 1, 1946
Electric power utilities.	13,208	+ 1.3	— 7.6
Byproduct coke ovens..	5,885	+12.7	+ 5.1
Steel and rolling mills.	878	+11.8	+43.7
Railroads (Class I)....	7,673	+10.3	—18.2
Other industrials*	18,304	— 0.7	+31.3
Retail dealers	3,166	+17.1	+27.7
Total	49,114	+ 4.1	+ 6.0

Bituminous Coal Consumption

	Thousands Net Tons Jan., 1947	P.c. change From Dec., 1946	P.c. change From Jan., 1946
Electric power utilities.	7,158	+ 6.3	+25.5
Byproduct coke ovens..	7,964	+17.9	+40.5
Steel and rolling mills.	929	+ 6.7	+38.6
Railroads (Class I)....	10,104	+ 6.2	— 7.9
Other industrials*	16,669	+24.3	+19.9
Retail dealer deliveries	12,945	+49.5	—13.5
Total	55,769	+21.4	+ 6.8

*Includes beehive coke ovens, manufactured-gas plants and cement mills.

Bituminous Production

February, 1947, net tons.....	50,640,000
P.c. change from January, 1947....	—13.9
Jan.-Feb., 1947, net tons.....	109,509,000
P.c change from Jan.-Feb., 1946..	—4.2

Anthracite Production

February, 1947, net tons.....	4,242,000
P.c. change from January, 1947....	—17.7
Jan.-Feb., 1947, net tons.....	9,397,000
P.c. change from Jan.-Feb., 1946..	—3.8

Sales, Domestic Stokers Vs. Oil Burners

	Stokers	Oil Burners
December, 1946	7,318	65,521
P.c. change from December, 1945	—40.4	+264.5
Jan.-Dec., 1946	181,223	499,009
P.c. change from 1945.....	+52.1	+257.3

Index of Business Activity*

Week ended March 15.....	191.8
Month earlier	190.7
Year earlier	167.5

Business Week, March 22.

Electric Power Output†

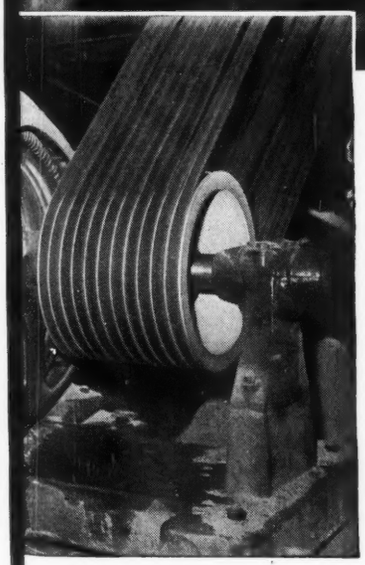
Week ended March 15, kw.hr....	4,763,843,000
P.c. change from month earlier.	—0.2
P.c. change from year earlier....	+19.5

†Edison Electric Institute.

nounced March 8. According to Charles Denby, counsel for the new owners, all mining operation will be continued but 400 miners' houses in several towns will be disposed of by the company.

• Kurzan & Kumpf Co., Zanesville, Ohio, is expected to soon open a strip mine near Zanesville, in Muskingum County. The mine will produce 500 tons daily from the No. 6 seam, and will ship via the Wheeling & Lake Erie R. R. John Kurzan and Carl Kumpf are the owners.

• Sale of the Pittsburgh, Shawmut & Northern R. R. and mining properties to Harry W. Findley, president, West Freedom Mining Co., Carnegie, Pa., for $1,505,000 was ordered March 3 by Federal District Judge Guy K. Bard. The 185-mile coal-hauling road has been in receivership for many years and last year was put in trusteeship and was offered for sale to the highest bidder. It was understood that the new owner would discontinue



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and more, and more, until you wonder how any belt can take so much. But it's the Homocord STRENGTH MEMBER infused and protected with FLEXLASTICS that makes this belt pay so well. Stout cords of chosen quality encased in Flexlastics are engineered to roll with the impact like good boxers—and to rebound to every shock . . . It's an engineered belt from core to cover, designed only for conveying and made only by Manhattan.

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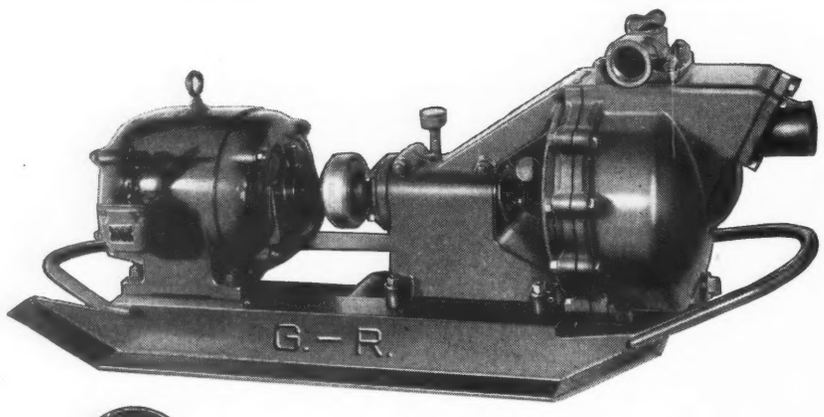
Only one moving part, the impeller, and no reduction gears. All wearing parts can be quickly and easily replaced by an inexperienced man with common tools.

Reliable and trouble-free — these pumps are ideal for remote locations or automatic operations.

Available in four sizes to meet any requirement. Write for special mine bulletin No. 301-46 or contact your distributor.

Model	Overall Lgth. Pump only	Overall Width	Overall Height	GPM at 20' total head
2162 (B-21½)	21½"	10"	13½"	48
9261 (40-40)	27"	12½"	14¾"	108
9262 (60-60)	27"	12½"	14¾"	165
9263 (60-100)	34"	17½"	21¼"	208
9361 (125-100)	34"	17½"	21¼"	250



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MEETINGS

- Fifth Anthracite Conference, Lehigh University: May 8-9, Bethlehem, Pa.
- American Mining Congress: annual convention and exposition May 12-15, Cleveland Auditorium, Cleveland, Ohio.
- American Coal Sales Association: annual meeting, May 22-24, Virginia Beach, Va.
- Rocky Mountain Coal Mining Institute: spring meeting May 26-28, Utah Hotel, Salt Lake City.
- Mine Inspectors Institute of America: annual convention, June 1-4, Denver, Colo.
- American Coke and Coal Chemicals Institute: annual meeting, June 9-11, French Lick Springs Hotel, French Lick, Ind.
- Smoke Prevention Association: annual meeting, July 7-10, Royal York Hotel, Toronto, Ont., Can.

operation of all but eight miles of main-line track.

• Reorganization of Castner, Curran & Bullitt, Inc., Pittsburgh, one of the oldest exporters of U. S. coal, has been announced by Eastern Gas & Fuel Associates, Boston, the parent company. Officers of the new organization, who are also sales officials of Eastern Gas & Fuel Associates, Coal Division, are: H. B. Baird, president; Walter Rothenhoefer, H. G. Ecker and W. M. Wells, vice presidents. D. T. Buckley is assistant to the president in charge of coal purchases, which will be made from both the parent company and other coal-producing companies.

• The Red Parrot Coal Co. is to install a drop-bottom bin and a 400-ft. declined belt conveyor at its Mine No. 5, Prenter, W. Va., to deliver coal from the newly opened Dorothy seam to the existing tipple and cleaning plant. A contract for the new facilities, which will have a capacity of 300 t.p.h., has been awarded to the Kanawha Mfg. Co.

• The New River Co., Mt. Hope, W. Va., has awarded a contract to the Kanawha Mfg. Co. for a new slope-belt installation at its Skelton mine for delivery of Beckley seam coal to the existing tipple. Coal is to be dumped underground from drop-bottom mine cars onto a 42-in.-wide 1,300-ft.-long 19-deg. belt conveyor capacity 350 t.p.h. The conveyor also will handle mine rock.

• Construction work to complete the all-important Beaver Creek highway, connecting three Eastern Kentucky Counties, Letcher, Knott and Floyd, is to start in the near future, according to reports.

The highway will connect the Elkhorn coal field with the Big Sandy and Beaver fields, making it many miles

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preparation plants are equipped

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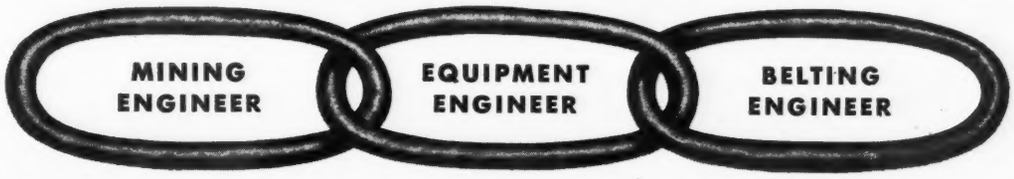

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UNITED STATES STEEL

nearer from points on the L. & N. for the Big Sandy river towns. A new railroad will traverse the same area and will be a branch of the C. & O. to reach undeveloped coal fields.

A new highway to be constructed 16 miles up Rockhouse Creek will penetrate the same territory as that to be reached by the L. & N. Contracts for the new C. & O. and L. & N. rail lines into this area have reportedly been awarded to the Codell Construction Co.

• The Gallatin County Coal Co., Junction, Ill., has been purchased by Lawrence Boutwell and Chester Wasson. The new owners are reported planning to make a slope mine of the present workings near the present shaft and materially increase the tonnage produced. Present production is understood to be 400 tons per day.

• The Richardson mine, 20 miles north of Gunnison, Colo., is being reopened after being closed for two years and a tonnage of 100 tons daily is expected by fall. Tony Krizmanich and Louis Simillion are expected to start operation on the Kubler side of the creek, and Tony Perusek, Jim Harris, Bill Harris and George Schaefer will re-open the original seam.

• Subsidiary companies of the Dominion Steel & Coal Corp., Ltd., are reported to have begun erection of the steel frame for the new $250,000 preparation plant at Stellarton, Nova Scotia. With a capacity of 2,400 tons daily, the plant will wash Pictou County coal from present operations and from a new colliery being opened to develop McBean seam (*Coal Age*, January, 1947, p. 102).

•

Plans Announced for Cleveland Coal Meet

Preliminary plans for the four-day Coal Convention and Exposition of the American Mining Congress, to be held in Cleveland, Ohio, May 12-15, were announced early last month. George H. Love, president, Pittsburgh Consolidation Coal Co., is chairman of the program committee; Harry M. Moses, president, H. C. Frick Coke Co., is chairman, coal division; and Thomas McNally, president, McNally-Pittsburg Mfg. Co., is chairman, manufacturers division.

An important part of the program, to be included for the first time since 1941, is the exposition of coal mining machinery and equipment presented by the leading manufacturers in the industry. The exposition, which was discontinued during the war, is to be resumed this year with 73 percent more exhibit space than ever before spoken for to date, according to convention officials. So far, 173 exhibitors are participating in the exposition.

The preliminary program of meetings and papers to be presented include: General Session—The Heat

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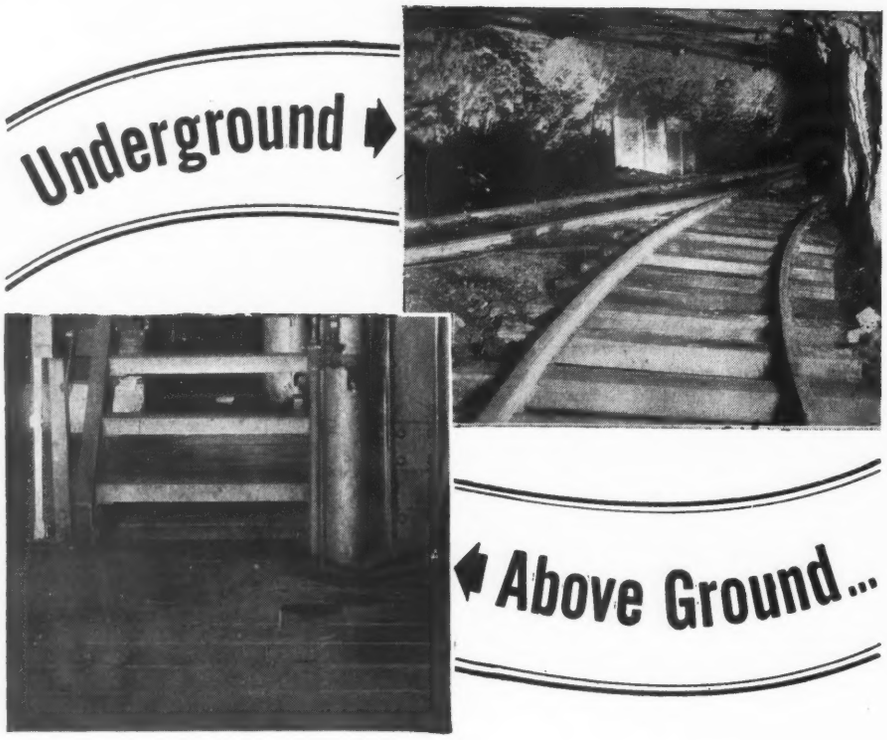

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LONGER SERVICE: Treated timbers and ties usually outlast untreated timbering 5 to 9 times! "CZC" makes them more durable, better able to withstand continued usage.

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Pump, Phases of Labor and Economics, speakers to be announced.

Surface Preparation—Recovery of Commercial Coal from Mine Refuse, A. F. Castanoli, Robinson & Robinson, Consulting Engineers, Charleston, W. Va.

Laboratory Control of Washing Plants, Jack Bishop, chemist, Truax-Traer Coal Co., Kayford, W. Va.

Clarification of Water and Closed Water Circuits, S. M. Parmley, Pittsburgh Coal Co., Pittsburgh, Pa.

Safety — The Mining Industry's Safety Progress, C. G. Brehm, supervisor of safety, Susquehanna Collieries Co., Nanticoke, Pa.

Mine-Fire Prevention, E. F. Maurer, general superintendent, Rail & River Coal Co., Bellaire, Ohio.

Man Trips Underground, Percy M. Cassidy, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Mechanical Loading — Operation with Power Duckbills, John Pschirrer, vice president, Pschirrer & Sons Coal Co., Canton, Ill.

Operation with Shortwaloaders, C. E. Hough, general superintendent, American Rolling Mill Co., Montcoal, W. Va.

Mechanical Loading with Large Crews and High Tonnage, G. N. McLellan, superintendent, Weirton Coal Co., Isabella, Pa.

Mechanical Loading with Small Crews and Low Tonnage, Joseph F. Mazza, supervisor of maintenance, Rochester & Pittsburgh Coal Co., Indiana, Pa.

Strip Mining—Drilling and Shooting Practices in Anthracite Strip Mining, Garfield A. Schnee, division engineer, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.

Drilling and Shooting Practices in Bituminous Strip Mining, Fred Horne, Sinclair Coal Co., Okmulgee, Okla.

New Developments in Strip Mining, J. W. Woomer, mining engineer, Wheeling, W. Va.

Handling Overburden in Anthracite Strip Mining, Robert Bazley, president, J. Robert Bazley, Inc., Pottsville, Pa.

Handling Overburden in Bituminous Strip Mining, speaker to be selected.

Greater Efficiency in Stripping Equipment Through Alloy Steel, A. F. Busick, chief engineer, Marion Power Shovel Co., Marion, Ohio.

Reclaiming Stripped Lands, Land Use Committee, National Coal Association, with reports from representatives of strip mining states.

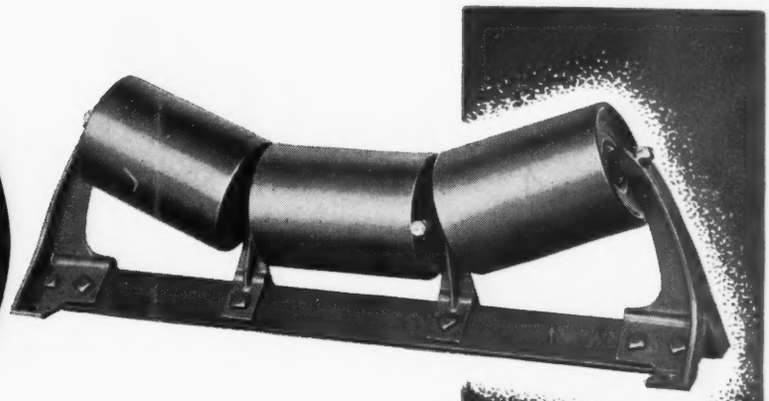
Coal Division Committees—Mine Haulage with Tracks and Belts; Underground Power Systems; Full Seam Mining; Pillar Recovery Methods; Accident Prevention in Coal Mining.

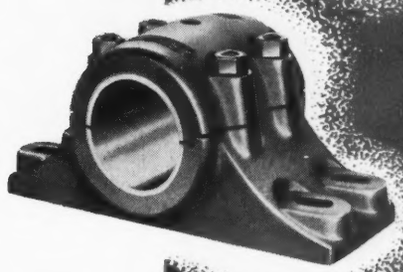
Underground Haulage — Economic Limits of Shafts and Slopes, G. S. Jenkins, vice president, Consolidated Coal Co., St. Louis, Mo.

Supply Haulage in Trackless Mining, Robert Fletcher, consulting engineer, J. H. Fletcher Co., Chicago.

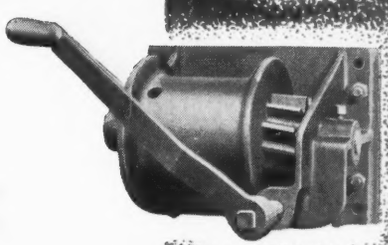
Handling Supplies and Repairs in

REPLACEMENT PARTS NECESSARY?

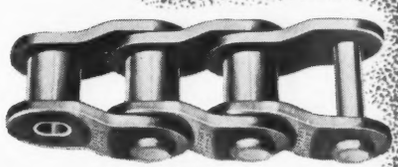


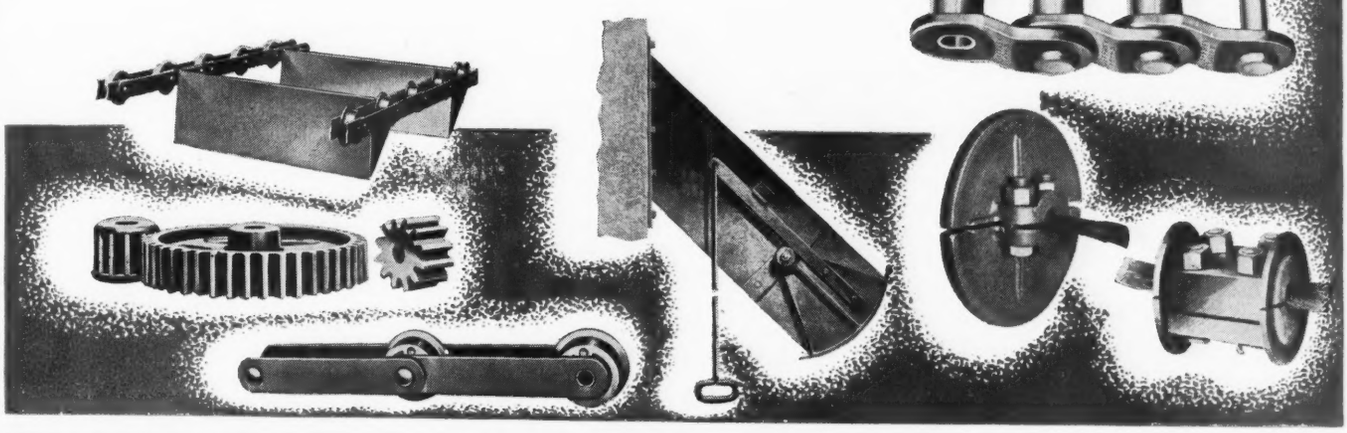


Insist on Jeffrey



Replacement parts for tipple equipment . . . the same high quality as originals they replace, plus recent metallurgical improvements.





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Complete Line of Material Handling, Processing and Mining Equipment

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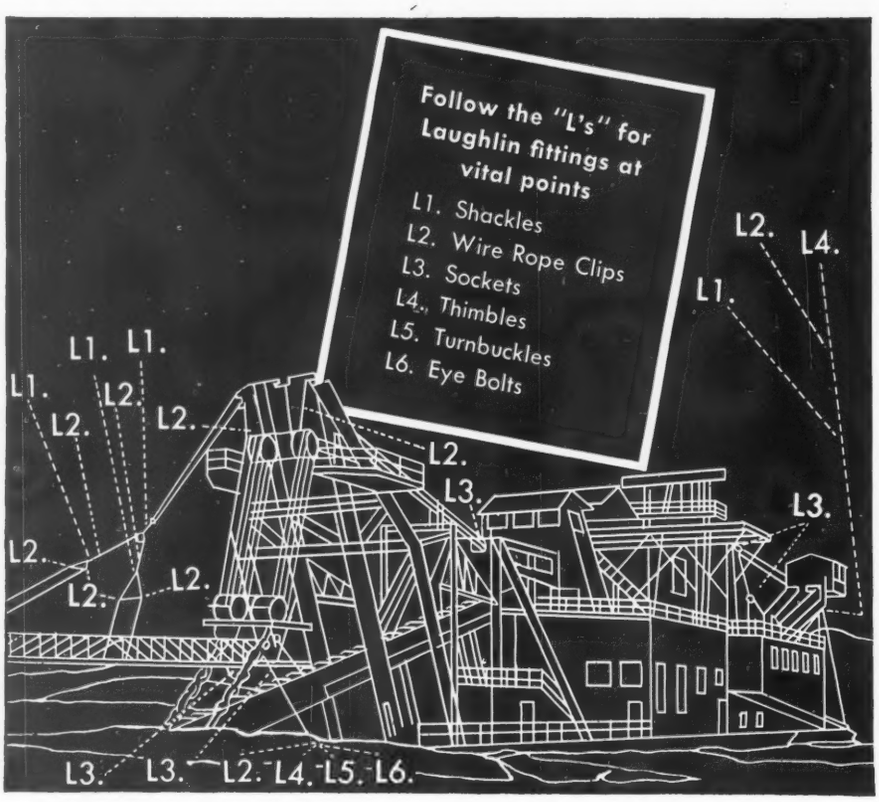

Wherever you use wire rope or chain you'll gain these extra advantages by specifying Laughlin quality fittings:

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The expense and delay of ordering "specials" are eliminated. You'll find the fittings you want are usually ***standard*** in Laughlin — the most complete line. Stronger because they're ***drop-forged*** and weldless, they'll outlast the wire rope. And 3 Laughlin "Fist-Grip" clips will do the work of 4 ordinary U-bolts.

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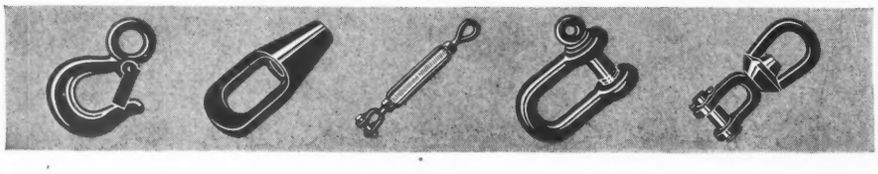
Lives, loads and equipment are safeguarded by Laughlin Safety Hooks and Safety Clips. Every Laughlin fitting is designed to protect your wire rope and chain — to bear its full share of the load and grip without crushing.

Your costly mining equipment needs the ***distributed*** protection of always dependable wire rope and chain fittings. Laughlin fittings provide that protection, with added economy and trouble-free service. For a complete catalog write to Dept. 6, THE THOMAS LAUGHLIN COMPANY, Portland 6, Maine. Laughlin fittings are distributed through mill, mine and oil field supply houses.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Shaft Mines, H. A. Quenon, general superintendent, Koppers Coal Division, Grant Town, W. Va.

Gathering Haulage—Effect of Mine Car Capacity on Mechanical Loading Efficiency, James Reilly, general manager, deep mines, Hanna Coal Co., St., Clairsville, Ohio.

Time Studies to Improve Shuttle Gathering, David R. Mitchell, Department of Mineral Engineering, Penn State College.

Prefabricated Track for Mobile Loading, Sterling Lanier Jr., president, Norton Coal Mining Co., Nortonville, Ky.

Face Preparation—Bugdusters on Shortwall Cutters, Ralph Perry, chief engineer, Sahara Coal Co., Chicago, Ill.

Tire-Mounted Cutting Machines for Trackless Mining, George R. Higinbotham, production manager, Consolidation Coal Co. of W. Va., Fairmont, W. Va.

Tire-Mounted Drills for Trackless Mining, C. M. Shott, vice president, Sheridan-Wyoming Coal Co., Inc., Monarch, Wyo.

Mine Timbering Machines, Harry S. Gay, vice president and general manager, Gay Coal & Coke Co., Mt. Gay, W. Va.

•

Peabody Mine Praised for Safety

The miners a..d management of the Peabody Coal Co. mine at Taylorville, Ill., were congratulated on their splendid safety record March 8 by Robert M. Medill, State director of mines and minerals. "You have contributed greatly," Mr. Medill wrote, "in helping Illinois continue to attain the best safety record in the nation among the mining industry."

Director Medill said that up to that present date the Taylorville mine had produced 7,002,126 tons of coal without a fatal accident. The last fatal accident occurred on June 17, 1941. The safety record, he said, covers a period of 1,602 working days. Nearly 500 miners are employed in the mine.

•

Heat-Pump Makers Plan Output for Winter, 1948

A substantial number of "flameless heaters," drawing stored-up warmth from drillholes sunk in the earth, will be available for the winter of 1947-48, according to recent claims by heat-pump manufacturers.

The General Engineering & Manufacturing Co., St. Louis, Mo., forecasts production of 20 units a day by September, 1947, and a greatly increased output in 1948. The Muncie Gear Works, Muncie, Ind., already has produced more than 100 units, most of which have gone to the Tennessee Valley Authority area where electric power is cheap, and expects to turn out 10,000 in 1948. The Terra-Temp Co., Indianapolis, Ind., has achieved

GET TO THE POINT

WITH AMSCO-NAGLE INDUSTRIAL PUMPS

AMSCO-NAGLE PUMPS GIVE GREATER SERVICE

Amsco design covers the two points that really determine the value of an industrial pump: (1) The service it will give and (2) The ease with which it can be maintained . . . any pump, worthy of the name, will handle the actual pumping.

Every feature of Amsco-Nagle Pumps is designed to resist abrasion and impact. Wide impeller clearances allow free passage of debris-laden liquids. Casing, impeller, and end plate are only parts contacting material being pumped—bearing housing is completely sealed off from water end. Anti-friction bearings are arranged to handle heavy loads. An example of Amsco's striving for the utmost in durability is the use of manganese steel, "the toughest steel known", for shells, impellers, sideplates and liners.

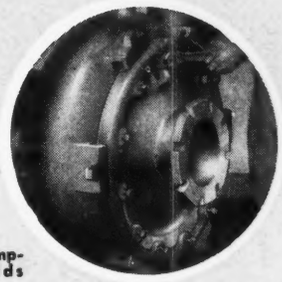


Figure 1—Clamping ring holds end plate.

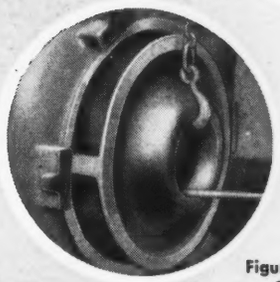


Figure 2—Impeller screws off.

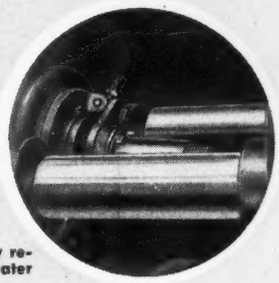


Figure 3—Easy removal of water end.

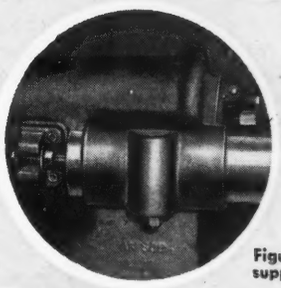


Figure 4—Tubular supports clamp in housing.

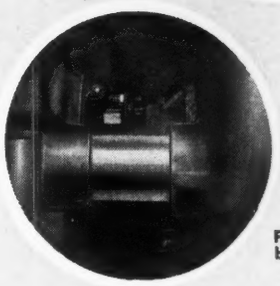
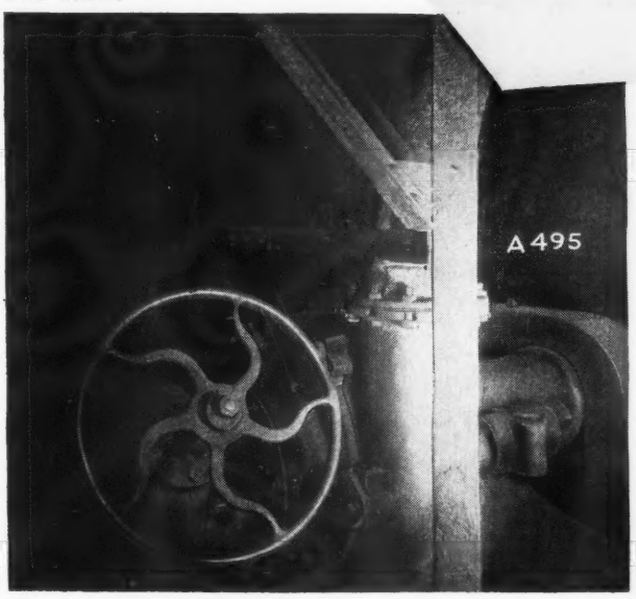


Figure 5—Accessible stuffing box.



AMSCO-NAGLE PUMPS ARE EASIER TO MAINTAIN

Water end parts subjected to wear can be adjusted or replaced easily and quickly. End plate comes off by simply removing clamping ring (clamping dogs on some models) — see Figure 1. Impeller screws off — see Figure 2. Or entire water end can be removed —see Figure 3. Tubes on casing clamp in bearing housing as shown in Figure 4— horizontal jack screw adjustment before tightening clamp bolts assures positive alignment of impeller in casing. Stuffing box readily accessible between tubes — see Figure 5.

Write for Bulletin describing these pumps.

Typical power plant installation of an Amsco-Nagle, 6", Type "T", Ash Handling Pump.

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AMERICAN MANGANESE STEEL DIVISION
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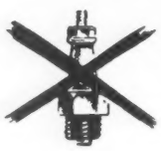
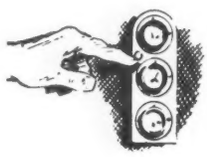
I Never Knew Diesel Power Could be so Simple to Operate



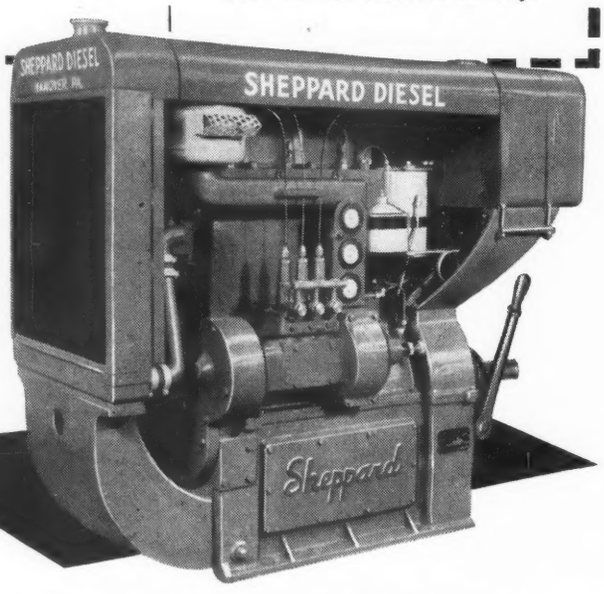
MY SHEPPARD *is a full diesel . . . has no distributor, coil or spark-plugs that need attention and care. Rain won't stop it.*

THE SHEPPARD *Diesel operates and starts on common furnace oil, injected in a solid spray. There is no temperamental carburetor to adjust and maintain.*



I SET *the throttle . . . push a button . . . and my Sheppard is running. Dependable power . . . free from all outside interference is at my fingertips.*

MY SHEPPARD *Diesel was delivered complete. I just put it in place, supplied it with fuel, lubricating oil and water and it was ready to work. There were no accessories to buy.*



Write for the illustrated booklet that completely explains many other outstanding advantages of Sheppard Diesel power units and generating sets

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Sheppard DIESEL

Generating Sets—2,000 to 36,000 Watts • Power Units—3¾ to 56 continuous H.P.

DIESEL'S THE POWER . . .

Sheppard's the Diesel

limited production and has set a goal of 5,000 units by the end of 1947.

Designs of the three manufacturers differ in details but the basic principle is identical. Various models installed in the past winter have passed sub-zero tests in several eastern and middle western areas. Naturally, the best markets will lie in cheap hydro-electric areas, such as parts of Tennessee and the West Coast.

•

Panther Valley Miners End Three-Week Stoppage

Six thousand miners in the Panther Valley area returned to work March 4 after a three-week strike to force payment of the $10.70 a day "consideration" wage. The men had walked out of the mines after a three-day sitdown strike by 13 contract miners 800 ft. underground at the Lansford colliery of the Lehigh Navigation Coal Co.

The Panther Valley general mine committee stated the company agreed to pay the "consideration" wage for two weeks even though natural hazards, or "abnormal conditions," prevented full-time work by contract men. The company declined comment.

•

Miners' Weekly Wages All-Time Industry High

Average weekly earnings of bituminous coal miners in December, 1946, were $69.56, according to statistics released by the U. S. Bureau of Labor, an all-time high for coal mining and all other industrial groups covered in the Bureau's analyses. The figure was exceeded only once in the Bureau's statistics when for February, 1946, brokerage workers received an average of $72.52 weekly. The previous record for industrial workers had been $68.68 received by ship-building workers in November, 1944. The average weekly hours worked by bituminous miners in December, according to the Bureau, was 46.7, and at that rate the weekly earnings would have been $80.43 if the full 54 hours had been worked.

•

New Mines Department Urged in Ohio House

A new Ohio State department of mines and minerals designed to give mining the same status now enjoyed by agriculture and industry was proposed last month in a bill introduced in the Ohio House of Representatives by Rep. L. P. Mooney (R.). Under the bill, which was being considered by the House conservation committee, the director of the new department would receive cabinet status with other department heads and would be paid $9,000 yearly. Salaries of all other department heads also would be raised from $6,500 to $9,000 by the measure.

You Can SEE That It's ONLY the SIDE of a V-Belt That Grips the Pulley and Gets the Wear!

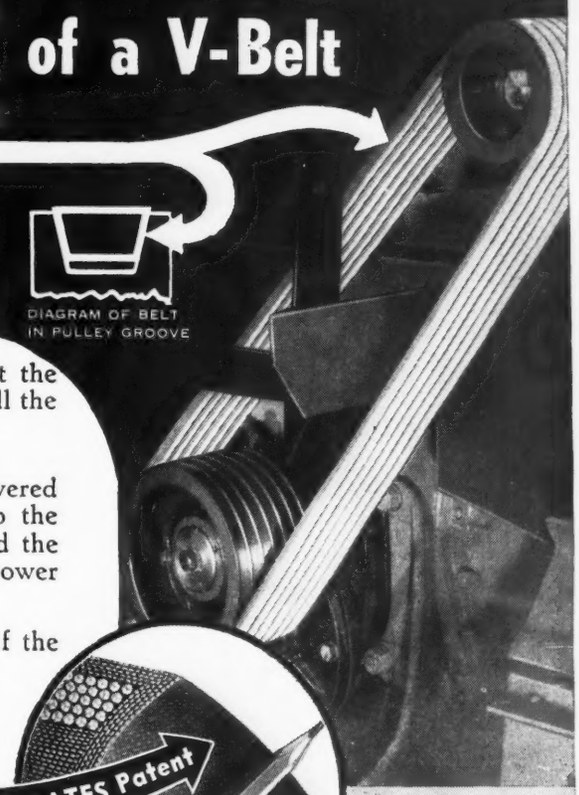


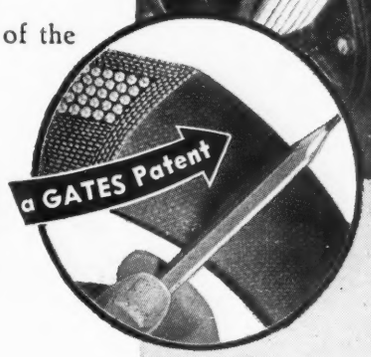
DIAGRAM OF BELT IN PULLEY GROOVE

Look at a V-Belt in its sheave and you see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

Notice, too—it's the *sides* that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole*. And then, once more, it's the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

—and Here Is How the CONCAVE SIDE



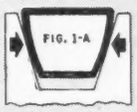
★REDUCES Sidewall WEAR and Lengthens Belt Life!

Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley



You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

★More Important NOW That STRONGER Tension Members are Used

Now that Gates *Specialized* Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

THE GATES RUBBER COMPANY Denver, U. S. A.

"World's Largest Maker of V-Belts"

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GATES VULCO ROPE DRIVES

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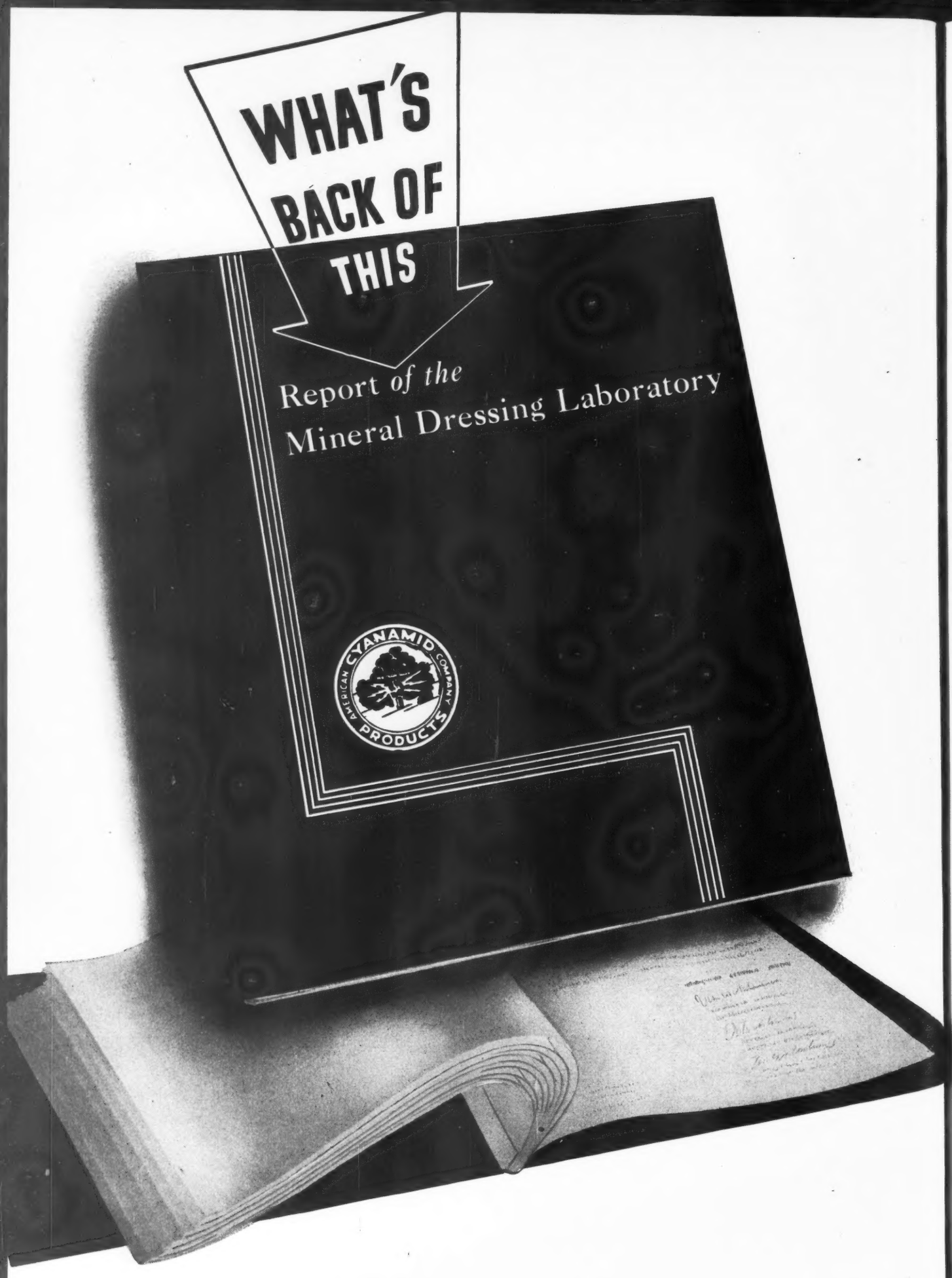

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Simple unequivocal answer: An unduplicated reservoir of technical talent and facilities which could not be economically justified on any one mining property.

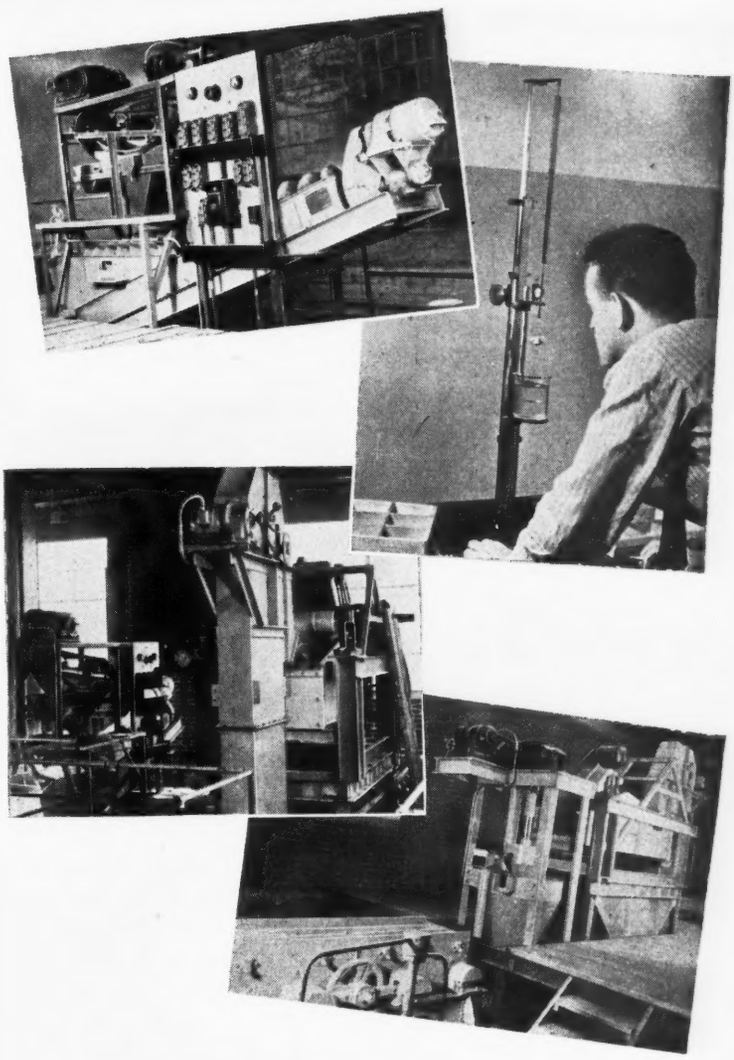
Cornerstone of two decades of sample-to-concentrates service on every type of mineral in every mining field of the world, a Cyanamid Mineral Dressing Laboratory Report represents the composite investigations of scores of metallurgists, microscopists, chemists, physicists and testing engineers . . . who can draw on the work of nearly a thousand scientists in other Cyanamid research activities.

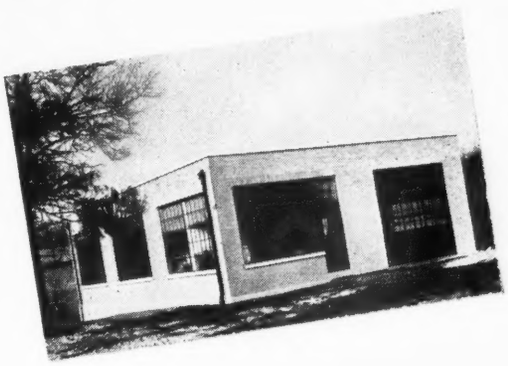
As applied to coal preparation by Heavy-Media Separation, a Cyanamid Mineral Dressing Laboratory Report brings you continuous-unit test results on your coal on samples up to carload lots run on commercial-size equipment. Back of these tests is Cyanamid's experience in the application of Heavy-Media Separation to beneficiating millions of tons of metallic and non-metallic minerals, and testing work on many coals in all size ranges and specifications for leading coal producers.

Upon completion of the report, we will give your engineers or the constructors of your choice the benefit of our experience in recommending and laying out equipment to handle the desired capacity. When the plant is ready to turn over, Cyanamid engineers are available to start the plant and train your operators during the initial operating period.

Thus, in the preparation of coal as in the treatment of metals and non-metallics, Cyanamid offers unbiased, trustworthy technical service backed by skilled personnel, comprehensive facilities for accurate testing and unmatched experience in the application of the processes we offer.

We invite all coal companies to write for complete information on the use of Heavy-Media Separation Processes for coal preparation and on our facilities for demonstrating the applicability of these processes on your coal.





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CYANAMID'S NEW KODACHROME FILM

"THE STORY OF AN ORE-SAMPLE"

New Cyanamid Film follows the sample from the time it is unearthed by the prospector until the Cyanamid Mineral Dressing Laboratory reports on how it may best be beneficiated.

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at technical-society meetings; colleges; mill and mine employee and management meetings, as well as at mining-community gatherings, etc., etc. Write for full details.

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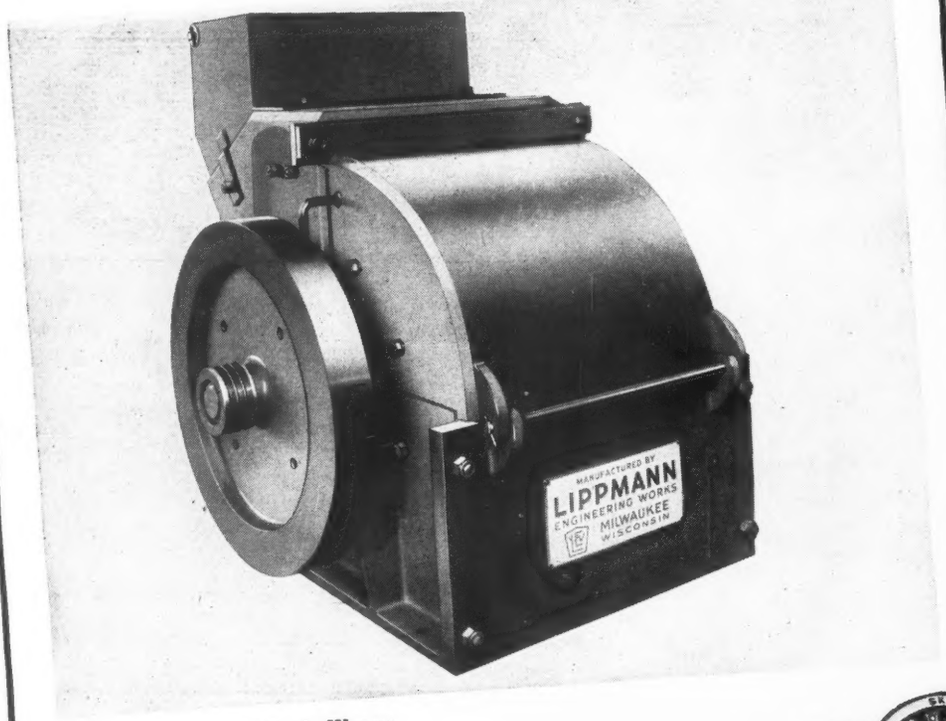

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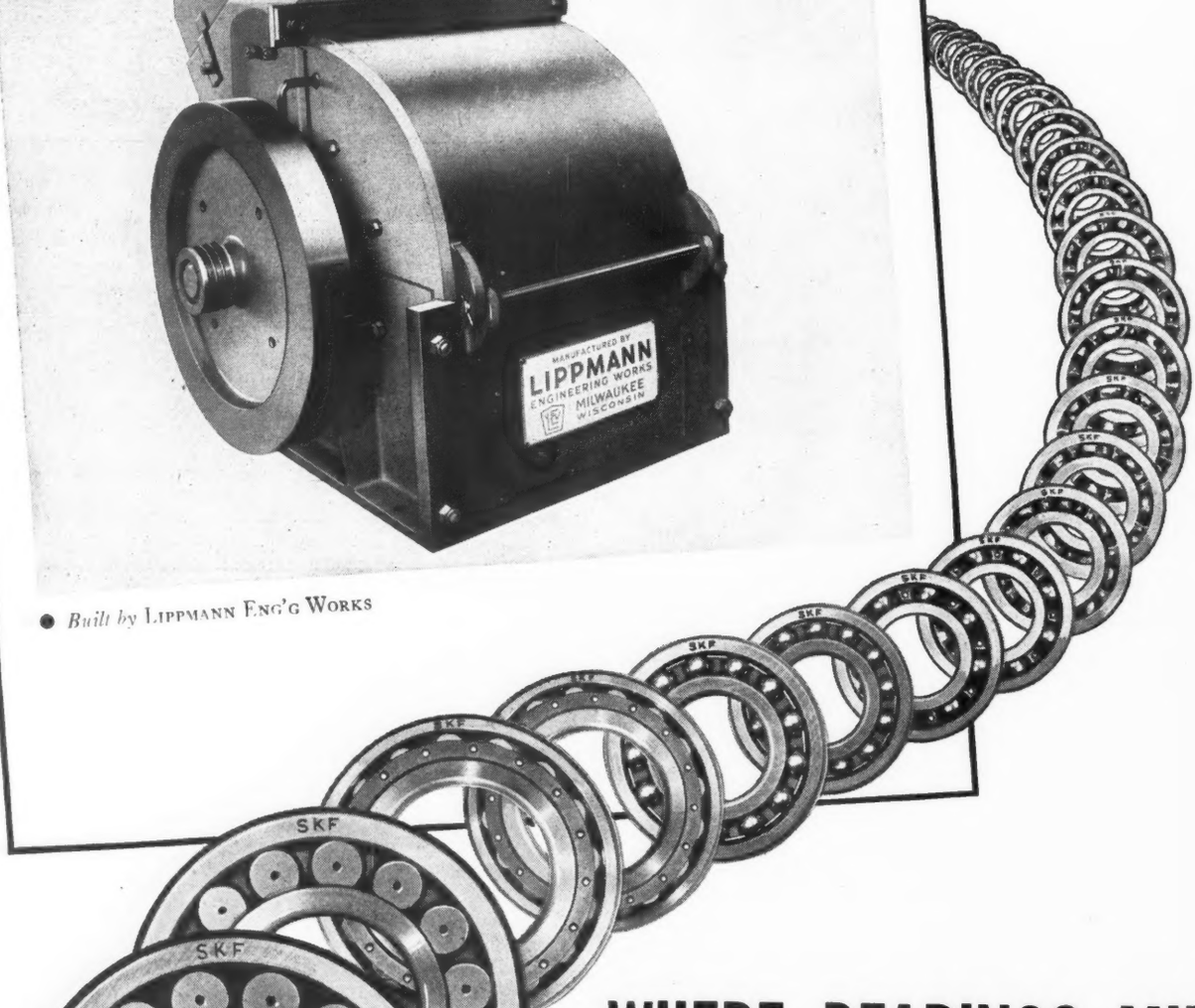

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PROTECTION

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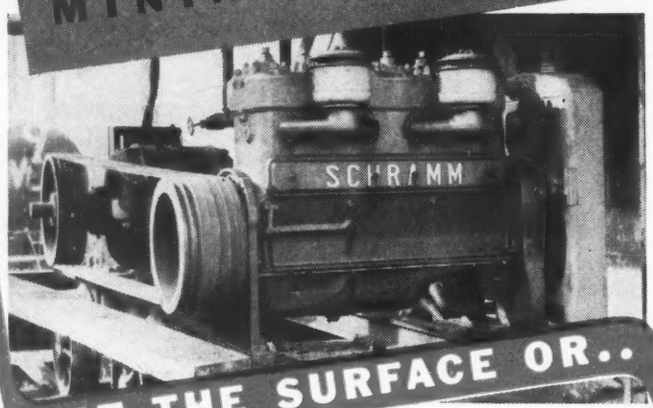
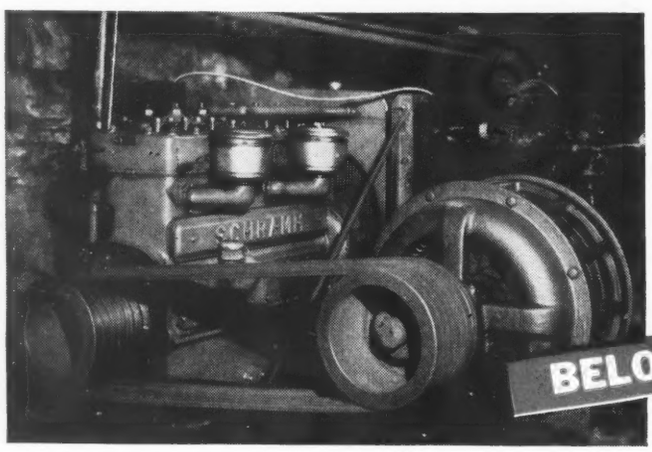


AT THE SURFACE OR..

Mining Engineers want ruggedness and dependability in an air compressor, portable or stationary . . . at the surface or down in the shaft. That's exactly what Schramm provides . . . plus four special features built into every Schramm Air Compressor: 1. 100% Watercooled, 2. Compact—Lightweight, 3. Mechanical intake valve, and 4. Forced feed lubrication.



BELOW

Write today for performance and construction details on these rugged, dependable units. We believe Schramm compressed-air-power will help make your mining operations easier.

SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

WAA Sells Utah Coal Mining Town

Sale of the entire town of Dragerton, Carbon County, Utah, to the Geneva Steel Co. for $1,553,000 cash was announced by the War Assets Administration March 5. The town was built by the government at a cost of $4,530,000 in 1943 to accommodate families of coal miners employed by the Geneva Coal Mines, which supply coal for the nearby Geneva Steel Co. plant, recently sold to the U. S. Steel Corp. The town includes 377 acres of land, 605 homes of four, five and six rooms with all modern conveniences, a theater, shopping center, post office, school, church, hospital and clinic, recreational buildings, dormitories, a water supply and sewage-disposal system and a fire department. The company will lease the dwellings to miners at reasonable rentals and, from time to time, will offer houses for sale.

•

Pennsylvania Seeks Mine Cave-In Law

A bill designed to prevent mine subsidences in the anthracite region was introduced March 10 in the Pennsylvania State House of Representatives by Rep. Michael J. Needham (D., Lackawanna). The proposed measure would make it unlawful to mine anthracite "so as to cause the caving, collapse or subsidence" of homes, bridges, streets, factories, cemeteries and railroad tracks.

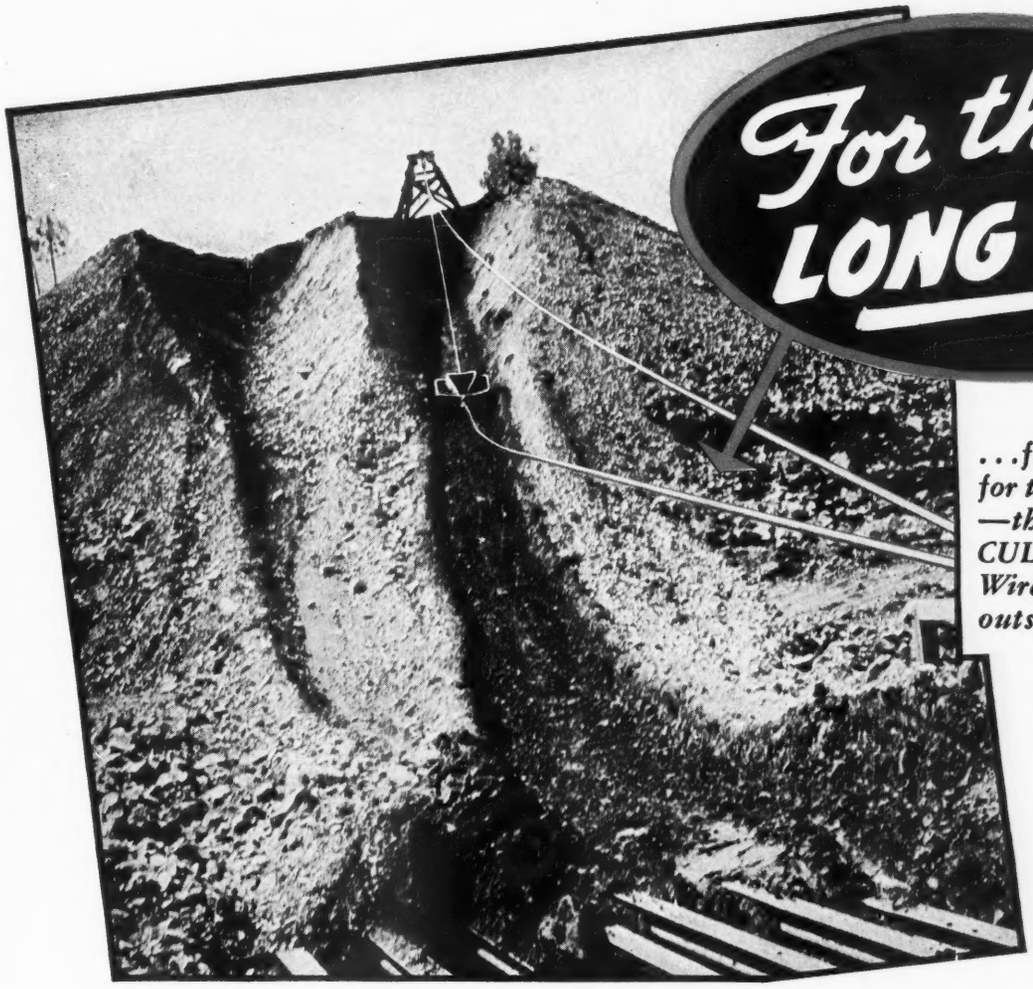
The bill would require mine operators to file plans of contemplated workings with city or county officials six months in advance of mining, under a penalty of $500 fine or a year in jail.

•

Stripping Rights Denied Under Old W. Va. Deed

While denying that strip mining was against the public policy, the West Virginia supreme court March 18 refused on other grounds the West Virginia-Pittsburgh Coal Co.'s right to buy land for stripping under a deed made in 1904. The Brooke County circuit court had previously ruled against the company on the grounds that strip mining was contrary to public policy.

The suit had been brought against Isabelle Strong and others to compel sale of 22.6 acres of surface lands at $100 an acre under the 1904 deed, which granted mining rights. The coal company contended that eight acres of coal involved could not be mined by other methods. The court held that the deed's provision for purchase of the surface rights at any time was a violation of the rule against perpetuities, and that since stripping was not generally used in 1904, the deed could not have contemplated use of the land for such purposes.



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. . . for the hard pull. . . for the continuous pull —that's where "HERCULES" (Red-Strand) Wire Rope proves its outstanding stamina!

Yes, here is a truly *tough* rope in Round Strand and Flattened Strand constructions—both Preformed and Non-Preformed —designed and fabricated to correctly meet every "heavy duty" Wire Rope requirement . . . regardless of clime, place or condition.

So, when your next job calls for *economical* service, over a 'long pull'—play safe, and let the Red-Strand be your buying guide.

Your inquiries are always welcome.

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LAMP ATTENDANT COST PER 100 LAMPS PER MONTH

EACH DOLLAR SIGN REPRESENTS $10.

100 WHEAT CAP LAMPS — $ $ $ $ $ — $50.50

100 BRAND "A" CAP LAMPS — $ $ $ $ $ $ $ $ $ — $88.87

BASED ON LAMPMAN AVERAGE HOURLY WAGE WITH LAMPMAN WORKING 25 DAY MONTHS

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100 WHEAT CAP LAMPS — 40.50 hrs.

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BASED ON STUDIES OF 9 DIFFERENT INSTALLATIONS HAVING AN AVERAGE OF 679 LAMPS . . . INSTALLATION WITH THE LEAST NUMBER 400, WITH THE GREATEST NUMBER 1600.

*"Jerk"—a single trucker who digs coal with pick and shovel from a roadside seam.

Write today

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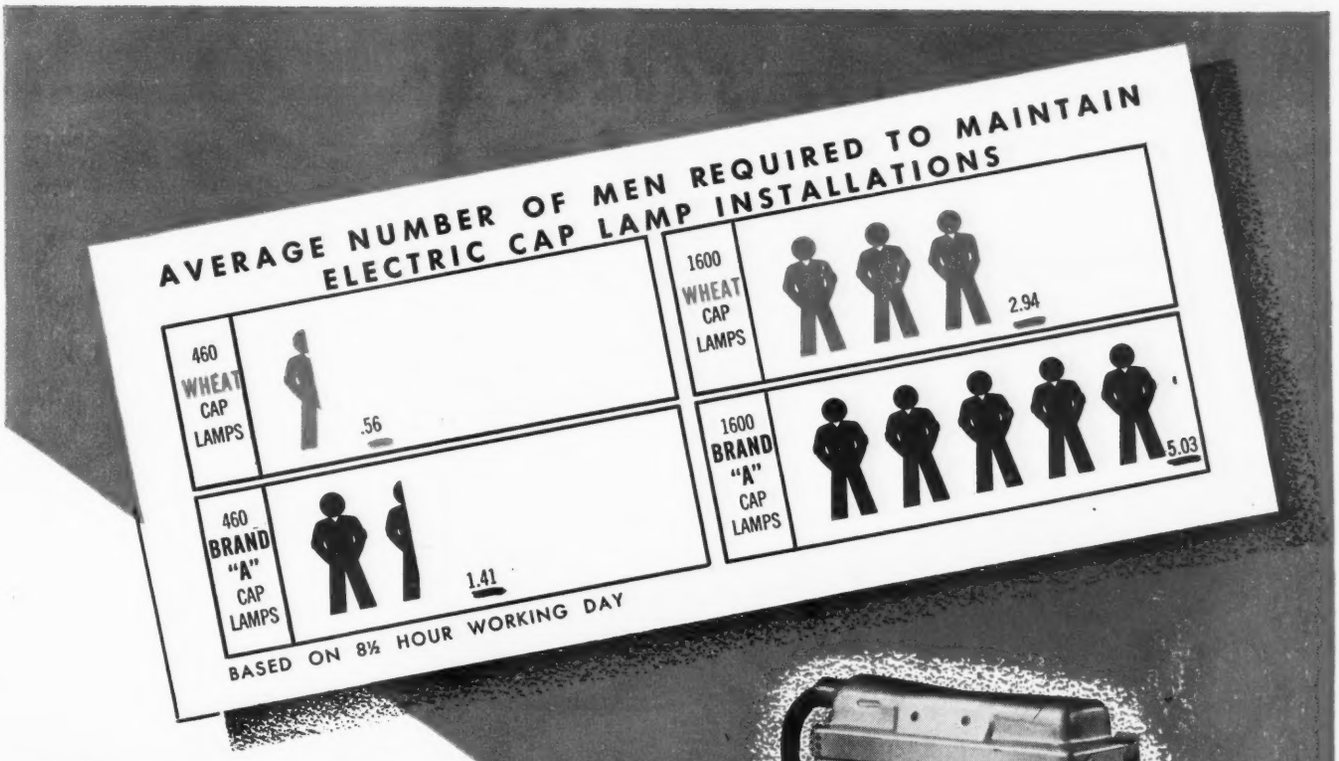

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Even though a "jerk" doesn't give a hoot about cap lamps, or their maintenance, he can see at a glance what lamps he would have if his operation was anything like yours. For any way you present the figures, the result is always the same—it takes fewer men, less time and inevitably it takes less money to operate a Wheat Cap Lamp Self-Service installation (Constant Potential Charging with only 5 Volts on the racks).

Nor is lower operating cost the only bright feature about Wheat Approved Cap Lamps. It is also a proven fact that Wheat Cap Lamps start bright and stay bright—maintaining over 80% of their initial efficiency at the end of the shift—a quality that means higher productivity with increased safety.

Because these are dollar-producing facts that you can't ignore, it will pay you to investigate Wheat—the productive cap lamp—now.

1. **Compact, lightweight, balanced, streamlined.**
2. **Steady, dependable light; 80% efficient at the end of the shift.**
3. **Emergency bulb means miner is never in the dark.**
4. **Simple, fool-proof, self-service charging system—battery charged through headpiece and cord of lamp.**
5. **Constant Potential Charging with only 5 Volts on the racks—no chance of electric shock with power on or off.**

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SPECIALISTS IN MINE LIGHTING FOR 30 YEARS

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BETTER LIGHT - LESS WEIGHT
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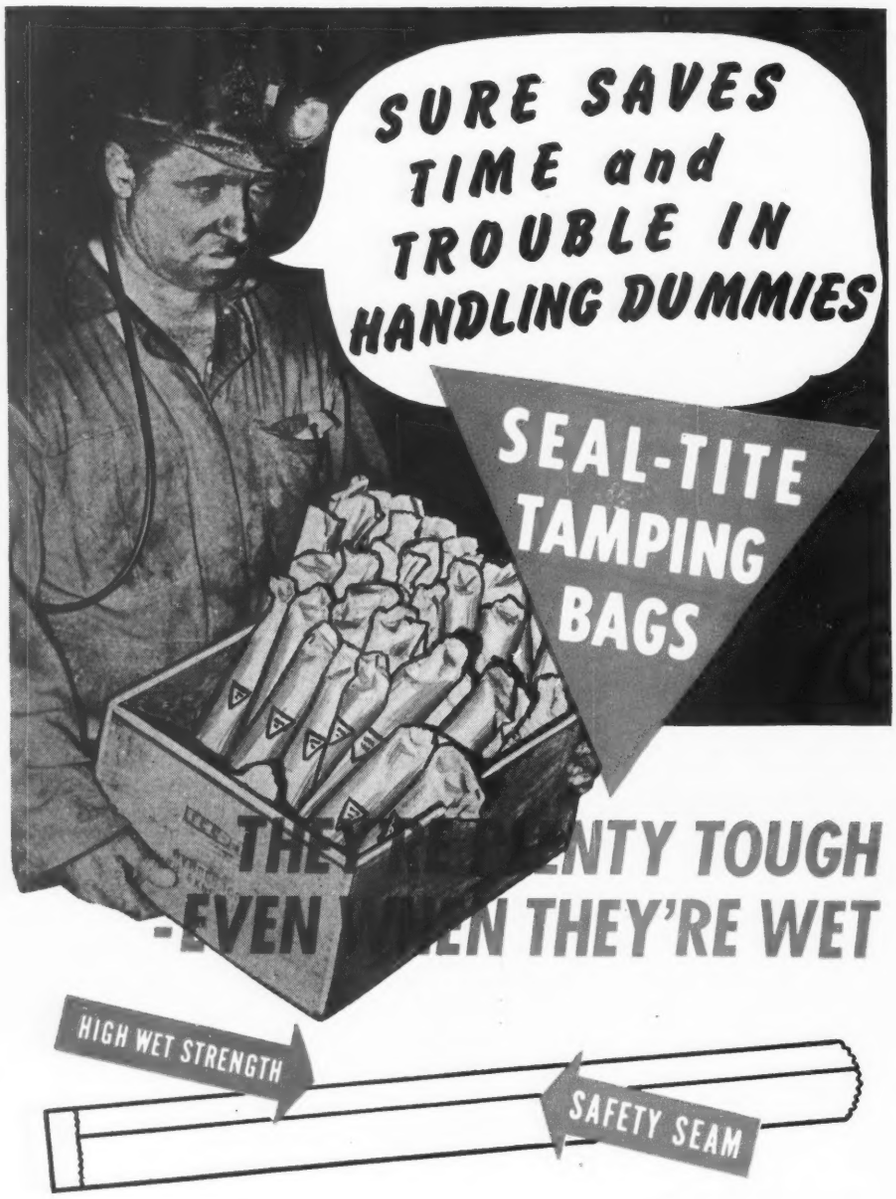

There's smoother going — from the dummy make-up to the borehole — with Seal-Tite Tamping Bags. They're *extra-tough* to take hard handling and their *high-wet strength* and *safety-seam* keep dummies safe from breaking or splitting.

Supplies of dummies are quickly, simply made up and may be safely stored underground for long periods under wet conditions—and they'll stay in shape ready to use—in Seal-Tite Tamping Bags.

***Send for free samples to try out*—give sizes wanted or we'll send an assortment—Write now.**

SEE DEMONSTRATION IN BOOTH 121 AT THE COAL SHOW IN CLEVELAND

Tamping Bag Co.

212 SO. THIRD ST.
MT. VERNON, ILL.

Mine Students Win Old Timers' Scholarships

The first two scholarships in a series to be given young mining men by the Old Timers' Club, an organization of coal-mining officials, have been awarded to Robert Maurer, son of Earl F. Maurer, general superintendent, Rail & River Coal Co., Bellaire, Ohio, and Donald McCaa, now a student at the School of Mineral Industries, Pennsylvania State College. Mr. Maurer is now enrolled in the School of Mines, University of West Virginia.

The Old Timers' Club aims at attracting promising young men to coal mining to fill future administrative and executive posts. In addition to offering scholarships, members of the club give winners the opportunity of summer work in their various mines.

•

Mine Rescue Station Opened in Kentucky

The Kentucky State Department of Mines has established a fully equipped mine rescue station at Pineville, Ky., and two inspectors are now making periodical inspections of coal operations in Bell, Knox and Whitley Counties. The office has equipment for detecting gas and the latest equipment for mine-rescue work. It is in charge of Noah Jackson, formerly employed by the Black Star Coal Corp. Howard Jones, another experienced mine worker, is an assistant. All mines in the three-county area are inspected at regular intervals.

•

Bill Would Ease Gas Act; Some Conversions Blocked

Legislation long sought by oil and natural-gas interests has been included in a bill introduced into the House of Representatives by Rep. Ross Rizley (R., Okla.). The proposed law would amend the Natural Gas Act of 1938 as follows: (1) prevent Federal Power Commission control over end-use; (2) ban FPC jurisdiction over direct industrial sales; (3) bar FPC from jurisdiction over production and gathering; (4) prohibit FPC control over distributing companies' activities; (5) eliminate compulsory "original-cost-depreciated method" and substitute the field-price method in determining costs for rate-making purposes; (6) direct FPC to make proper allocation of costs between jurisdictional and non-jurisdictional classes of properties, revenues and expenses in determining the rate base; and (7) compel quick action on applications for certificates. A companion bill has been introduced in the Senate by Senators Moore (R., Okla.), and Ferguson (R., Mich.).

Meanwhile, in the wake of natural-gas failures in late winter cold snaps, the Allegheny Ludlum Steel Corp. announced Feb. 28 that it was pre-

RELIANCE MOTORS Power

7 of every 10 Coal Loaders

This Joy Coal Loader is mechanically simplified by the use of electric drive.

Enjoy the same advantages that created this preference by specifying Reliance Motors for other mining equipment

The dependable and economical performance of Reliance Motors—frequently in two and three shift service "down under"—has made them the first choice for coal loaders. And you can have this same outstanding performance in the heavy duty motors Reliance has designed especially for other underground and surface equipment.

Next time you're ordering new equipment—specify Reliance. See for yourself how Reliance Motors help keep production up and costs down.

Visit the RELIANCE EXHIBIT
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Booths 1320 and 1322, Public Auditorium, Cleveland
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This muddy footing can't stop the LINN . . . one of a fleet working on a coal refuse disposal operation in Pennsylvania.

The LINN *flexible* traction unit fits itself to the footing on any job . . . it follows the terrain contour, biting in to give maximum traction over rocks, mud, clay, stumps, ice, snow or burning bone. The tracks are extremely wide insuring adequate traction and preventing "sinking in" on soft or boggy ground. LINNS carry the load—every day throughout the year!

Available with capacities from 5 to 50 tons in a variety of body styles for every type of mine haulage requirement. For specifications write to our General Sales Office, 250 West 57th Street, New York 19, New York.

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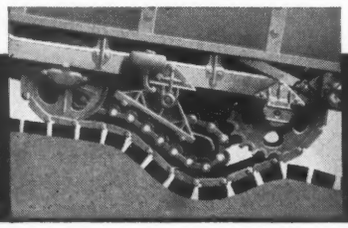
Manufacturers of Haftraks for Over 30 Years



LINN HAFTRAK
CONTOUR TRACTION

paring to convert all possible facilities to oil and city officials in Cleveland readied bids to well drillers for sinking exploratory gas wells on city-owned properties along the Lake Erie shore line. In Louisville, Ky., the Louisville Gas & Electric Co., facing demands in excess of capacity, halted installation of new gas heating equipment and conversions from coal and advised dealers to cancel orders to equipment manufacturers for gas burners. Similar action was reported in Indianapolis, Cincinnati and elsewhere.

More detailed plans for an 1,800-mile pipeline costing $85,600,000 and extending from the Hugoton field to Detroit, Milwaukee and other cities in Wisconsin, Michigan, Iowa and Missouri were announced by the Michigan-Wisconsin Pipe Line Co. and the Austin Field Pipe Line Co. Construction will begin late in 1947. Ultimate capacity will be 325,000,000 cu. ft. The construction contract has been awarded to Ford, Bacon & Davis, Inc.

Plans for a 1,000-mile, $55,000,000 line from the Houston, Texas, area to West Virginia were announced March 6 by the Tennessee Gas & Transmission Co. Construction will begin as soon as authority is granted by FPC and materials are available. This expansion, together with other projects already under way, will increase capacity of the system to 600 million cubic feet.

The Northern Natural Gas Co. has requested FPC authorization for new facilities to increase capacity to 580 million cubic feet. Proposed facilities would include 320 miles of 26-in. line from Kansas to Nebraska and 245 miles of 24-in. line from Nebraska to Minnesota.

Early in March, the Justice Department gave its approval to the sale of Big and Little Inch pipelines to the Texas Eastern Transmission Corp. War Assets Administration officials, however, estimated that it would be from 9 to 15 months before the lines are finally turned over to the purchaser, since several condemnation suits must yet be filed by the government as owner of the lines. Meanwhile, attorneys for the WAA and Texas Eastern are said to be working on terms of a lease that would be effective until the sale becomes final.

•

United Electric Seeds Strip Lands

The seeding of 600 acres of strip-mine spoils by airplane has been completed at the Fidelity mine of the United Electric Coal Cos., near DuQuoin, Ill. Paul Seastrom, president of the company, said it took one plane eight hours to scatter 8,000 lb. of seed in 50-ft. widths, with the plane flying at low altitude and two men guiding its course.

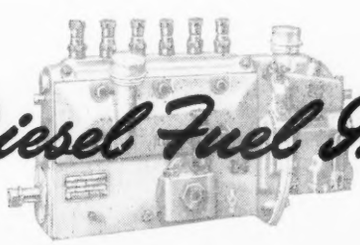
Lack of funds to grow seedlings has slowed reforestation in Ohio—not only of strip-mined areas, but of

SKILL ..at your Service

At American Bosch, the experience-born skill of thousands of pairs of hands operating modern machines is at the service of the American Diesel industry and its thousands of users.

So, too, are available the experience of engineers who have worked closely with the industry for years . . . fully equipped laboratories . . . productive capacity that has kept pace with the industry's rapid growth . . . field service which keeps the equipment operating as the makers intended . . .

. . . which may serve to explain why a large majority of America's Diesel Builders equip their engines with American Bosch Diesel Fuel Injection Equipment. AMERICAN BOSCH CORPORATION, Springfield 7, Mass.



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AUTOMOTIVE AND AVIATION ELECTRICAL PRODUCTS

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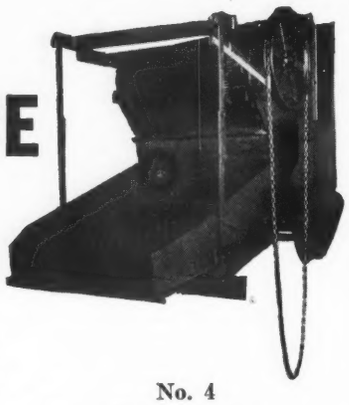


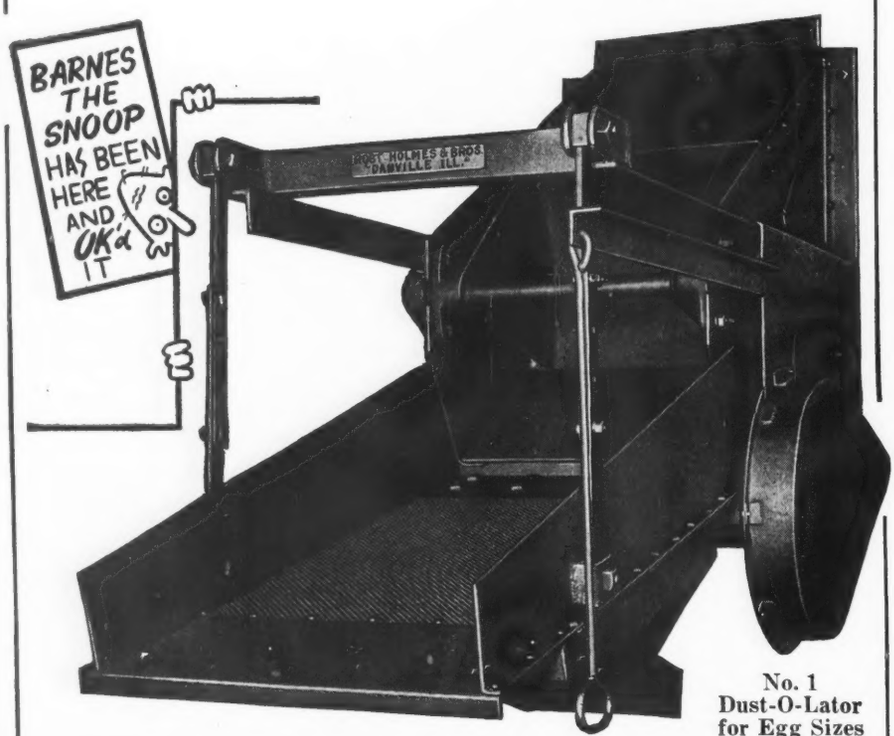
HOLMES DUST-O-LATOR is a self-contained unit combining a withdrawal gate mechanical screen and automatically controlled power unit for use in removing objectionable dust and fines from the coal as it flows to the truck.

Dust-O-Lators provide a final screening to remove such degradations as may carry over from the primary screening plant.

Dust-O-Lators are made adaptable to any type of bin. Units available for side or bottom discharge.

No. 4
Dust-O-Lator

For handling lump or run of mine sizes, consists of undercut gate operated by chain wheel. Gate passes up through flow stream assuring a positive closing of opening regardless of lump size. Gate locks in both open and closed positions.



No. 1
Dust-O-Lator
for Egg Sizes

ROBERT HOLMES AND BROS.

BINS - GATES - LOWERING SPIRALS - DUST-O-LATORS - SHAKING GATES

DANVILLE, ILLINOIS

other waste lands—Robert R. Paton, forester in charge of state nurseries, told the Columbus Chapter of Friends of the Land recently. Mr. Paton said 99 percent of the state's waste land would grow a cover of trees, but that artificial measures are necessary to speed the process.

Larry Cook, executive secretary of the Ohio Reclamation Association, declared that stripping operations make a better forest area than unglaciated land with thin top soil. He reported more than four million trees have been planted in stripped areas.

A third speaker in the panel discussion, Dr. A. C. Chapman, chief of the division of forest management of the Central States Forest Experiment Station, said 10 years of experimentation have shown black locust and pine are most successful in first plantings of spoil banks.

●

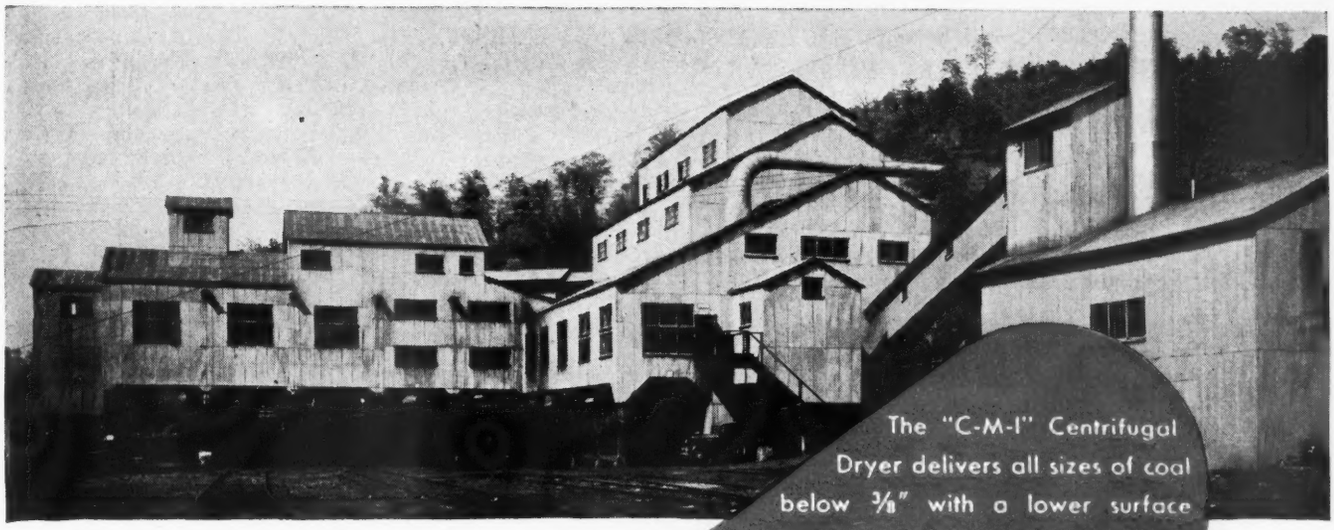
Smoke Abatement Group Expands Activities

Because of the great demand by cities throughout the country for technical information concerning smoke abatement, the Coal Producers' Committee for Smoke Abatement recently voted to increase its engineering personnel. Composed of coal producers from the Appalachian producing district, Northern West Virginia, Ohio, Western Pennsylvania and Western Kentucky, and five of the leading coal-hauling railroads of the country, the Committee seeks to assist cities throughout the country by analyzing smoke problems and suggesting remedies for their solution.

During 1946 more than 60 cities were visited, R. E. Howe, chairman of the committee, announced. "In many of these cities complete surveys of cross-sections of the heating and power plants were made, from which it was possible to make a comprehensive analysis of the pollution problems of the individual municipalities. These cities now have a workable plan to bring about the abatement of smoke."

Henry Hebley, director of research, Pittsburgh Coal Co., Pittsburgh, Pa., was elected vice-chairman of the Committee. Mr. Hebley is regarded in the industry as one of the outstanding authorities on air pollution and he is the author of many articles on the subject. He is now engaged in compiling all factual data on the subject which he expects to bring out in book form.

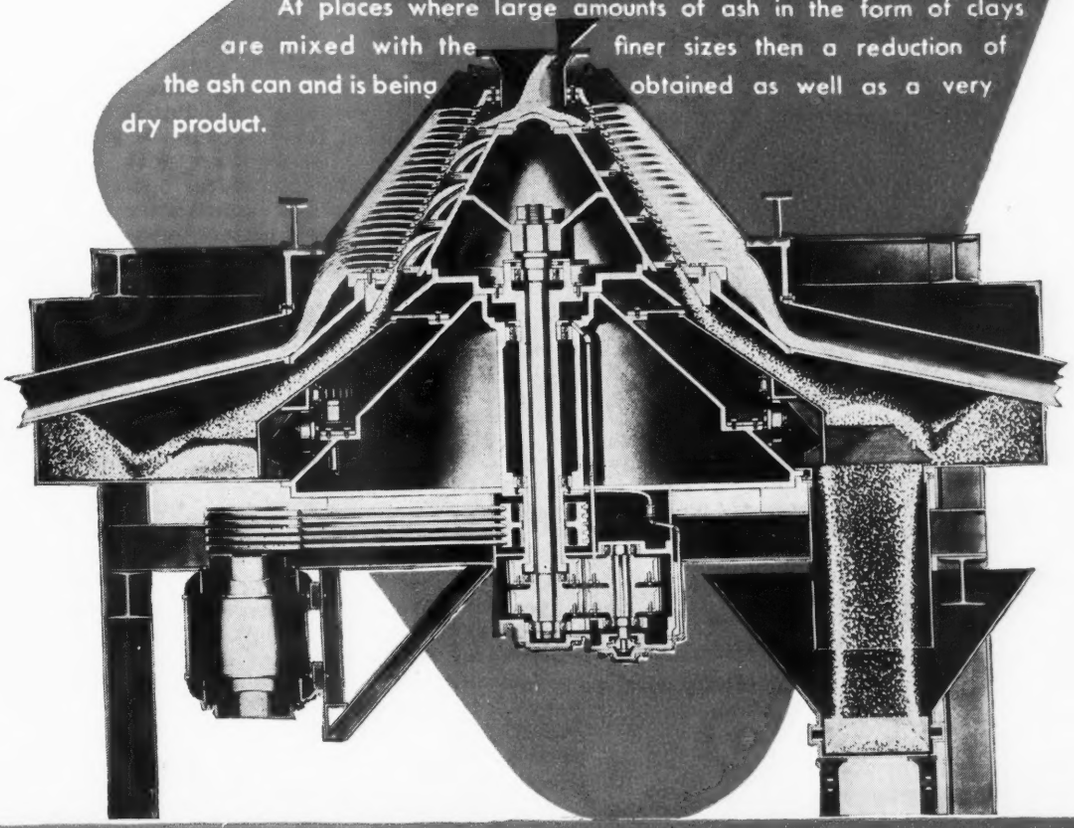
A special sub-committee on railroads was named at the meeting to work directly with the railroads in promoting and solving the abatement of smoke. J. D. Clark, chief fuel supervisor, Chesapeake & Ohio R. R., Richmond, Va., was named chairman of the committee. Other members are: J. S. Swann, fuel conservation engineer, Louisville & Nashville R. R., Louisville, Ky.; A. A. Raymond, superintendent, fuel and locomotive per-



The "C-M-I" Centrifugal Dryer delivers all sizes of coal below 3/8" with a lower surface moisture content than can be obtained by any other mechanical dewatering machine or method. And with very little degradation.

For those plants where recovery of all the finer sizes is required, then by a closed circuit arrangement practically all the fines may be recovered and used, even down to the minus 200 mesh particles.

At places where large amounts of ash in the form of clays are mixed with the finer sizes then a reduction of the ash can and is being obtained as well as a very dry product.



Use the *"C-M-I" Continuous Centrifugal* to dry your smaller sizes of coal at the lowest ultimate cost.

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PIN TIMBERING
JACK
AND HOW IT FACILITATES FACE TIMBERING.... CUTS TIMBER COSTS.... SAVES TIME AND GIVES INCREASED SAFETY IN MODERN MINING
DUFF-NORTON JACKS

...with Complete Details on the New Face-Timbering System in Modern Mining

Here's a New Duff-Norton Bulletin you should have. It gives complete data on the New Pin Timbering System and the Duff-Norton Pin Timbering Jack. It illustrates and describes how the new system and jack saves time in the timbering cycle, cuts costs of posts and other timbering materials, and gives added safety in working places. We will gladly send as many copies of the bulletin as you desire.

Write for your copy today!

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THE DUFF-NORTON MANUFACTURING CO.

PITTSBURGH 30, PENNSYLVANIA

There is a Distributor Near You

formance, New York Central System, Buffalo, N. Y.; and Walter Lloyd, assistant engineer in charge of coal inspection, Pennsylvania R. R., Altoona, Pa.

It has been announced that the next smoke abatement survey would be made in Detroit, Mich. It was pointed out that Detroit was a typical example to prove that smoke abatement is a technical job and not one that can be achieved by legislating against certain types of fuel. Detroit has a preponderance of gas and oil consumers and most domestic consumers use the best grades of low-volatile coal.

By a vote of 8 to 1, the Cincinnati City Council March 6 enacted a smoke-abatement ordinance, following a campaign that lasted several years. The measure requires that coal of not more than 26-percent volatile content be used in hand-fired equipment, that owners show cause why equipment should not be sealed after three violations in a year, that all new installations of hand-fired equipment be limited to those that can be operated smokelessly, that heating plants in buildings with more than four apartments be inspected annually, and that railroads use smoke-eliminating devices on steam locomotives.

Progress in testing commercial models of its smokeless heater was reported March 12 by Bituminous Coal Research, Inc. Early reports on practical field tests going on in four major cities, Chicago, Cincinnati, Indianapolis and Pittsburgh, "indicate that these heaters are giving smokeless performance with high-volatile coals, trouble-free operation, and require less manual attention than conventional heaters," according to James R. Garvey, BCR development engineer.

In the railroad field, BCR reports, modern overfire steam-fire jets as designed by BCR are being used extensively by railroads to control smoke from coal-burning locomotives. A recent poll by BCR shows that 32 railroads have 1,840 locomotives so equipped, which includes 536 road engines and 1,304 switchers.

•

Anthracite Institute Holds Dealer Courses

An extensive program of merchandising schools for retail coal dealers and their employees has been prepared for spring and fall, it was announced March 7 by the Anthracite Institute. The schools, which the Institute conducted for many years until they were interrupted by the war, were resumed last fall but a revised curriculum, tailored to fit current conditions has been prepared for the new series, which was to start early in April.

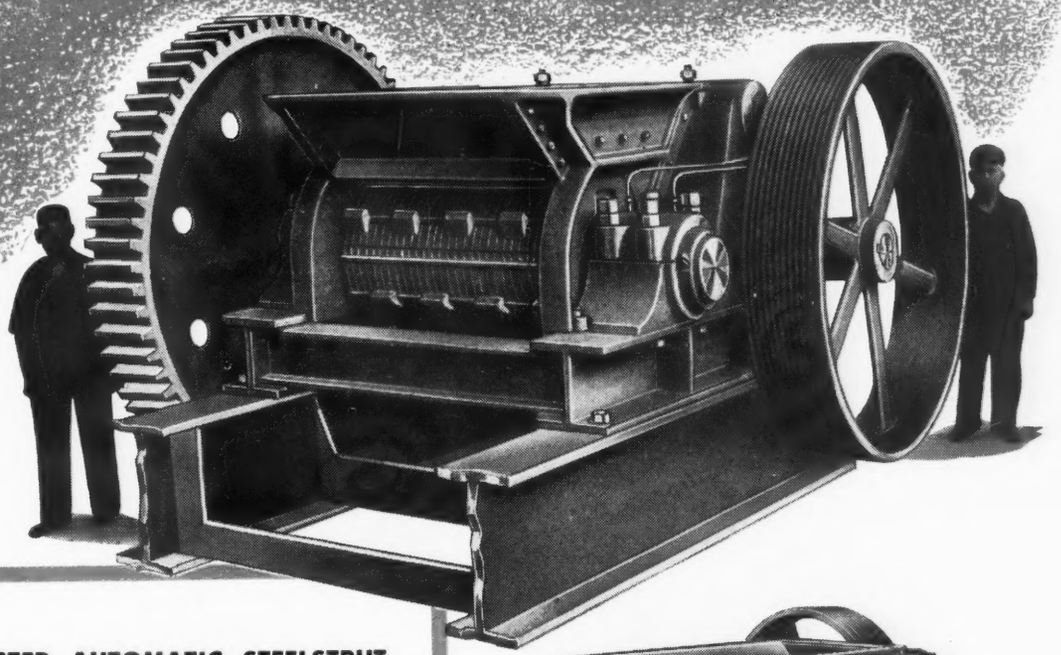
Purpose of the schools, which are arranged for by field representatives of the Institute working in cooperation with local and state dealer associations, is to help the dealer merchandise anthracite successfully in a

Modernize your production with

McLANAHAN

SINGLE ROLL

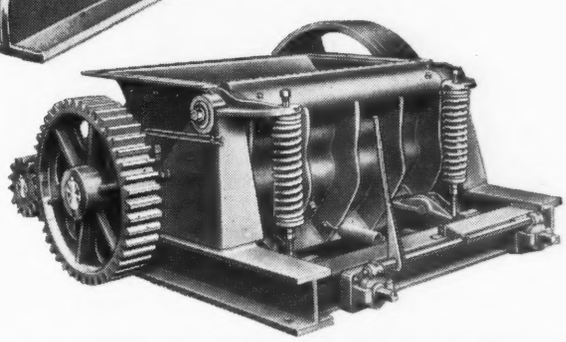
MINE REFUSE AND COAL CRUSHERS!



THE ROCKMASTER AUTOMATIC STEELSTRUT TOGGLE PRIMARY CRUSHER— REMARKABLE POWER AT LOW COST

Note These Real McLanahan Production Features . . .

● All Steel Constructed ● Cast Steel Gears ● Automatic Steelstrut Toggle for Tramp Iron Protection ● Chilled Alloy Iron or Steel, Interchangeable and Reversible Crushing Plate Liners ● Hard Surfaced Steel Segment Rolls Easily Replaced Without Dismantling Machine ● Takes Choke Feed ● Dry, Muddy, Wet or Frozen Material Never Packs ● Lowest Proportion of Flats and Dust Produced ● Slowest Speed of Moving Crushing Elements ● Greatest Crushing Range with Opening Easily Adjustable ● Takes Large Primary Sizes ● Low First Cost—Low Power Cost—Minimum Repair and Upkeep Costs.



FABRICATED BLACK DIAMOND CRUSHER

guarantees highest ton-per-dollar value!

One piece, rigid, well proportioned steel frame, cut steel gears, V-belt drive and industrial type lubrication. Automatic tramp iron protection.

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"TRAVELING MAN'S DELIGHT"

FAMOUS U. S. ISSUED PATENTS

No. 5 OF A SERIES

THE HAMMOCK

No. 400,131 Patented Mar. 26, 1889

"This invention relates to an improvement in hammocks, and has special reference to a hammock so constructed that it can be slung from and used with the backs of the seats of ordinary railway passenger-cars . . . so that passengers may be able to *sleep with ease and comfort...*"

(Language inside quote marks taken directly from U. S. Patent.)

Fig. 1.

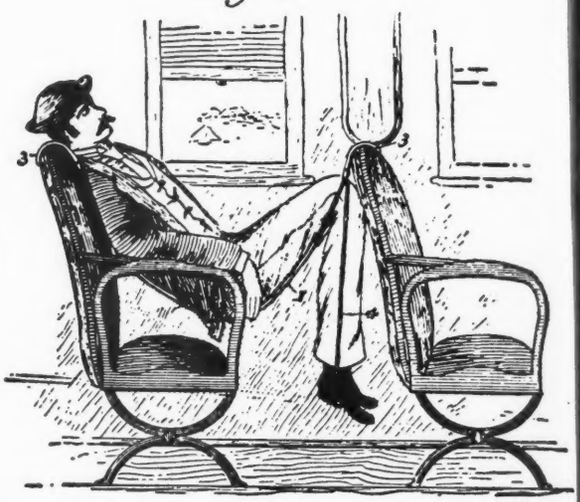
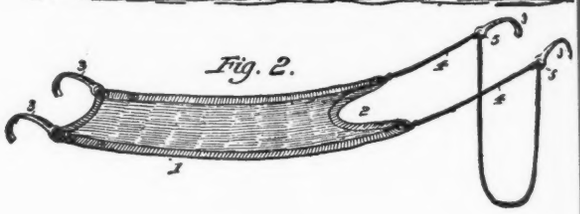
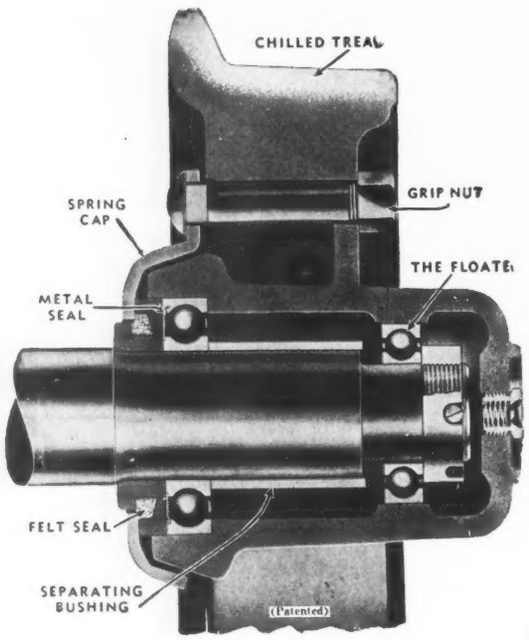


Fig. 2.



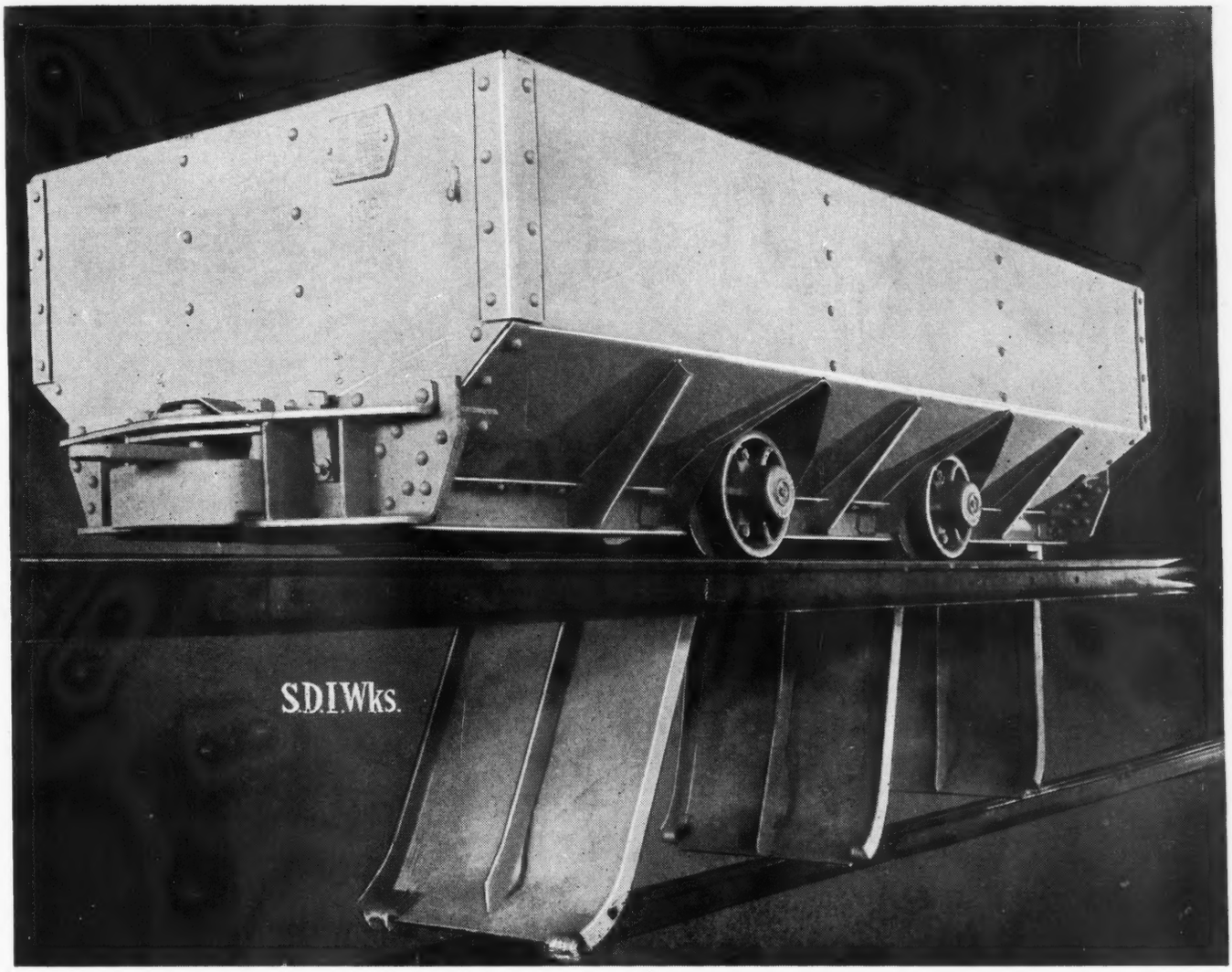


THIS FELLOW TAKES IT EASY... YOU CAN TAKE IT EASY TOO. HOW? BY USING S-D "AUTOMATICS" AND S-D "FLOATER" WHEELS.

You grease "Floaters" about once in 5 years. With "Floaters" you can increase your load hauled by locomotive 50 percent. Increase over-all efficiency tremendously. "Floater" wheels are guaranteed against breakage or bearing failures for 5 years. We make it easy for you.

"SEE THE NEW S-D 1-2-3 'AUTOMATICS'

Sanford-Day Iron Works, Knoxville 9, Tennessee



Take It Easy By Using S-D "Automatic" Cars. How?

1—No uncoupling of trains of cars for dumping.

2—No tipping up on ends to dump.

3—No turning upside down to dump.

4—S-D "Automatics" bottom-dump automatically, on the run, about a ton per second with 4 ton cars.

5—Practically no repairs—cars get such easy service.

6—Practically no labor at tipple house.

7—You can lease the cars, forget about investment or financial worries.

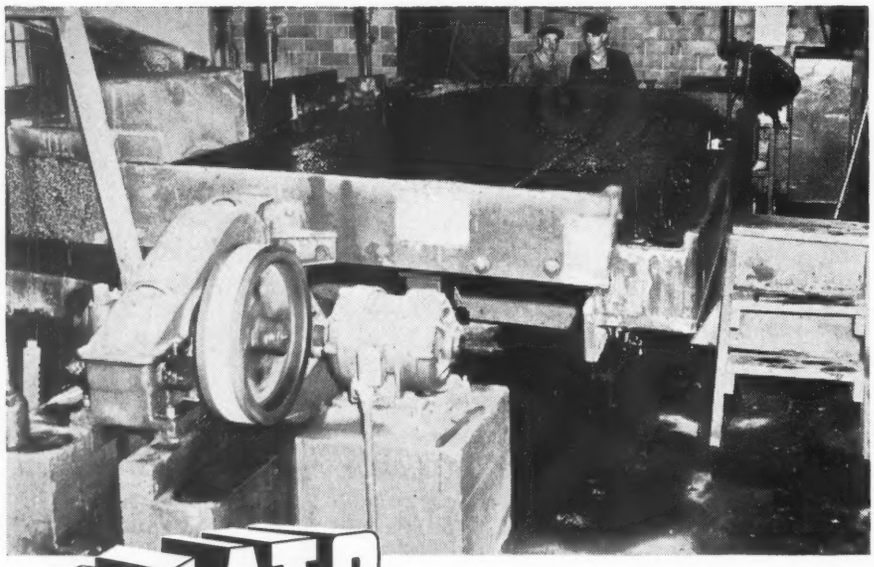
8—If you buy the cars you pay for them out of the money you save.

9—This is the easiest way we know of for you to make money. Why not investigate our proposition now!

10—Make it easy on yourself, don't take life so hard when you don't have to. Let us make things easy for you.

IN OPERATION AT CLEVELAND MAY 12-15"

Sanford-Day Iron Works, Knoxville 9, Tennessee



PLAT-O by DEISTER

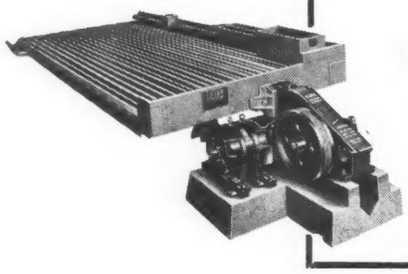
Processed Sludge Fuels Power Plant

One of the two 16-foot Plat-O Coal Washing Tables in use at the Antioch Power Company, Linton, Indiana.

Tipple sludge, processed by two 16-foot Plat-O Coal Washing Tables, is used by the Antioch Power Company, Linton, Ind., as fuel for their power plant which supplies the city of Linton and four nearby mines with electric power.

Centrifugal pumps force the sludge from the Friar Tuck and New Hope mines to Antioch's washing house, where the 10-mesh material goes directly onto the tables. The Plat-O Tables, in use four years, handle all the sludge from both mines and get excellent recovery.

This is another example of the favorable experience operators everywhere have had with Plat-O Coal Washing Tables. Plat-O Tables get essentially complete recovery of fines as small as 1/16" x 0", at a normal rated capacity of 15 tons per hour. This usable, marketable coal is recovered economically . . . one man can watch and supervise the operation of 20 tables because separation is automatic and always in full view.



VISIT OUR BOOTH...

No. 1451 . . . at the CLEVELAND COAL EXPOSITION

DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

highly competitive fuel market. The entire course is keyed to the problem: "How to help the consumer."

Teams of three field representatives conduct each school. The full course is covered in either three afternoon sessions of four hours each or in two six-hour sessions given on successive days. A tentative schedule has been prepared for 54 different locations in anthracite's primary marketing area. The course includes a review of anthracite industry economics, the work of the Institute, basic properties and uses of anthracite, hand-fired heating plants, controls and automatic equipment, types of heating systems, salesmanship and customer service.

•

SFAW Increases Coal Exports

The improved level of the Nation's stockpiles and the rate of bituminous coal production indicate the availability of larger quantities of the higher grade coals for export during March than have been available heretofore, Acting Solids Fuels Administrator Oscar L. Chapman recently announced. "So that there may be a gradual rather than an abrupt transition from a controlled to an uncontrolled export program," Administrator Chapman said, "the policy of the Solid Fuels Administration for War has been relaxed beginning with exports in March."

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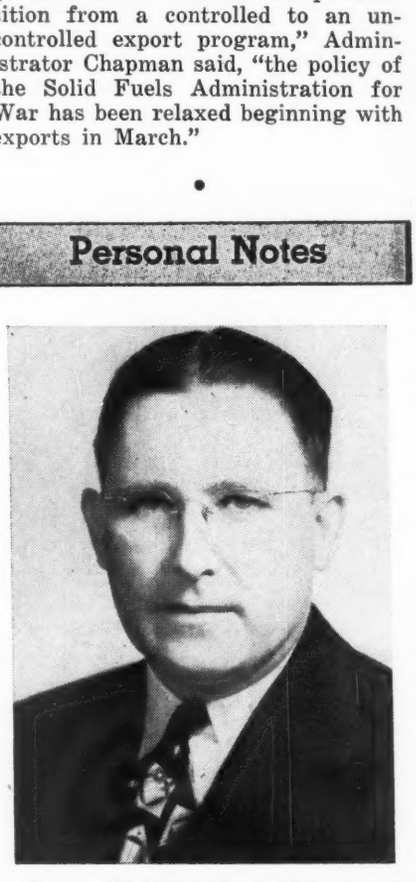
Personal Notes



George M. Rigg, formerly manager in charge of operations, has been named vice president and general manager of the Weirton Coal Co., Isabella, Pa.

Robert J. Blair has been appointed assistant general superintendent,

OUR TEACHERS—

They Need The Help Of Business Now

THIS is an appeal to raise school teachers salaries—fast. Such appeals are commonly addressed, rather vaguely, to the conscience of the community. This one is not. It is addressed directly to the business community, and to its hard core of common sense.

As a whole, the school teachers of the nation are taking an economic beating. So, too, are their close associates and co-workers, the librarians. In purchasing power, public school teachers salaries, after taxes, average about 20 percent less than they did eight years ago. Beginning salaries of librarians, always low, have fallen behind an equal amount in purchasing power. College and university teachers are not much better off. The pressure is particularly heavy on those in the lower ranks. As a group, teachers and librarians are close to the bottom of the economic heap.

Unless this situation is remedied promptly, it is confidently to be expected that:

1. The more competent teachers will continue to desert our schools in droves, and our libraries will remain inadequately staffed. More than 350,000 teachers — many of them the very able ones—have left the public school teaching staff of about 900,000 in the last six years. More than 100,000 of the replacements are "substandard." They cannot meet the minimum educational requirements of their jobs which, by admission of the profession itself, are none too high.

2. Those who remain will be organized increasingly into economic pressure groups. Teachers strikes and the rapid growth of unionism among teachers at present clearly indicate what is in store.

Many business men are so deeply disturbed by the resort to the strike weapon by some teachers to enforce their salary demands that their sympathy for the general plight of our teachers tends to be dulled. Such an attitude is understandable. It avails nothing, however, in eliminating the crisis in education caused largely by teachers salary troubles.

The crisis in education is a crisis for the nation as a whole. The work of our schools, colleges and libraries is such that its deterioration means deterioration of the nation. However, the salary crisis in education is in special measure a crisis for the business community. That community has a special stake in having a well-educated and well-disposed constituency.

Education and Unionism

There may be room for disagreement as to whether teachers should organize themselves in trade unions, and follow trade union tactics. However, there is no conceivable room for disagreement as to whether organization of teachers into a fighting economic pressure group under the lash of a teachers salary crisis would be a body blow to business. Among many teachers it would foster an abiding hostility to the institution of business which, occupying a key position in the life of the community, had not done its utmost to make such unionization unnecessary by taking a lead in relieving the teachers salary crisis.

In our work of publishing technical periodicals and text books, we at McGraw-Hill meet and come to know many teachers and librarians. We know that, as a group, they have little appetite for participation in militant economic pressure groups. They are far more interested in making a militant assault on ignorance and prejudice through concentration on their professional work. If, through neglect of their economic needs by the business community, they feel forced to resort to trade union organization and tactics, the teachers and librarians can be expected to have an abiding re-

sentment toward the institution of business. That resentment will, in turn, be communicated in no small measure to the coming generation. Such is the nature of the educational process.

The crisis in education is not, of course, exclusively a matter of salaries. Unsatisfactory working conditions also play a part. Many schools are dilapidated and terribly overcrowded. So are some libraries. Some small-town school boards oppressively insist that the school teachers be the paragons of piety the board members wish they were themselves. Protection of a proper degree of academic freedom is sometimes missing. The teacher is rarely accorded a prestige comparable to the importance of the job. Elements such as these aggravate the crisis in education. But the first and absolutely essential step toward surmounting the crisis is to provide tolerable salaries.

Because of the enormous diversity of local conditions affecting teachers and librarians salaries, no general rule for emergency action would fit all cases. From state to state, average yearly expenditures on education in 1940 varied all the way from about $30 per pupil to about $150. Some states, like Nebraska, finance their schools almost exclusively from local taxes. Others, like Delaware, rely almost entirely on state taxes. Some states and communities have already acted to meet the salary crisis. Others have not. Variations such as these limit any generalization.

Guide for Emergency Action

But as a general proposition it can be safely said that the minimum requirements of the emergency will not have been met so long as the salaries of class room teachers and junior members of college faculties and library staffs have not been increased by the amount necessary to keep them abreast of the increase of about 50 percent in the cost of living since 1939. In many cases, a temporary cost of living adjustment might prove the best way to handle the problem.

This suggestion, let it be repeated, is not offered as a solution of the salary problem, but as a start. With their salaries increased enough to meet the increased cost of living, the teaching and library groups as a whole would still have cause to envy the current economic position of industrial workers. Since 1939, the average of weekly earnings of industrial workers after taxes, has outstripped the rise in the cost of living by about 21 percent.

However, a start and an absolutely essential start would be made toward giving America the sort of educational system it must have not only to fulfill its ideals but holds its own in this highly competitive world. We worry, and I think rightly, about having the free world engulfed by Russian Communism. According to the best figures available, the U.S.S.R. is spending about twice as large a share of its total national income for education as we are. The figures compared include our expenditures for both public and private education. That comparison is really something to worry about.

States Should Take Lead

In dealing with the salary crisis it is up to the teachers to display a maturity and integrity worthy of their profession. Teachers have many employment advantages, such as long vacations. They should not slur them over in making comparisons of their annual incomes. Also employment in teaching and libraries has been notably stable. Teachers and librarians should not ignore that fact in comparing their position with those whose employment has been far less steady.

At the same time, the great fiscal difficulties involved in solving the crisis in teachers and librarians salaries must not be used as an excuse for postponing effective action. The states are better equipped financially and otherwise to take such action than is the federal government and, with the localities directly involved, should take the lead. If the price of effective action is a heavier tax burden for communities already too heavily burdened that price must be paid. The crisis presents a major emergency. To handle it as anything less is to court irreparable damage to the nation as a whole, and a special measure of damage to business as well. The intelligent self-interest of business requires that it leave nothing undone to meet and master the crisis in education.

President McGraw-Hill Publishing Company, Inc.

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SAFETY BONDED CORD

Makes these 3 Huskies Stronger and Sturdier!

U. S. ROYAL *Con-Trak-Tor*

For off-the-road service where heavy loads roll over rough ground. Deep cleated tread for two-way traction; heavy buttressed lugs for sure grip in soft going; center running rib for longer wear, easier steering.

U. S. ROYAL *LOGGER*

For all operations where traction, long wear and rugged strength are required. Cut-resisting tread protects against injury from rocks, snags. Self-cleaning design maintains maximum traction, prevents rock retention.

U. S. ROYAL *Fleet Delivery*

For service that subjects tires to abrasive "stop-and-start" wear. Extra-thick, massive tread and buttressed shoulders deliver *more* mileage, protect sidewalls against curb scuffing. Center running rib makes rolling easier, adds to tread life.

These rugged U. S. Royals have the *extra* strength of U. S. Safety Bonded Cord construction! *Each cord* is rubber-coated for heat and friction insulation . . . and "webbed" together into a tire fabric unequaled for wear!

In *all three* the tire body is attached to the steel wire beads by a specially designed bead anchoring that rigidly ties the beads to the carcass. And *all three* have two extra shock pads under the tread to guard against impacts and blowouts.

The *tread* design of each tire is the result of extensive engineering tests *in the field!* The result? *Peak performance!*

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UNITED STATES RUBBER COMPANY

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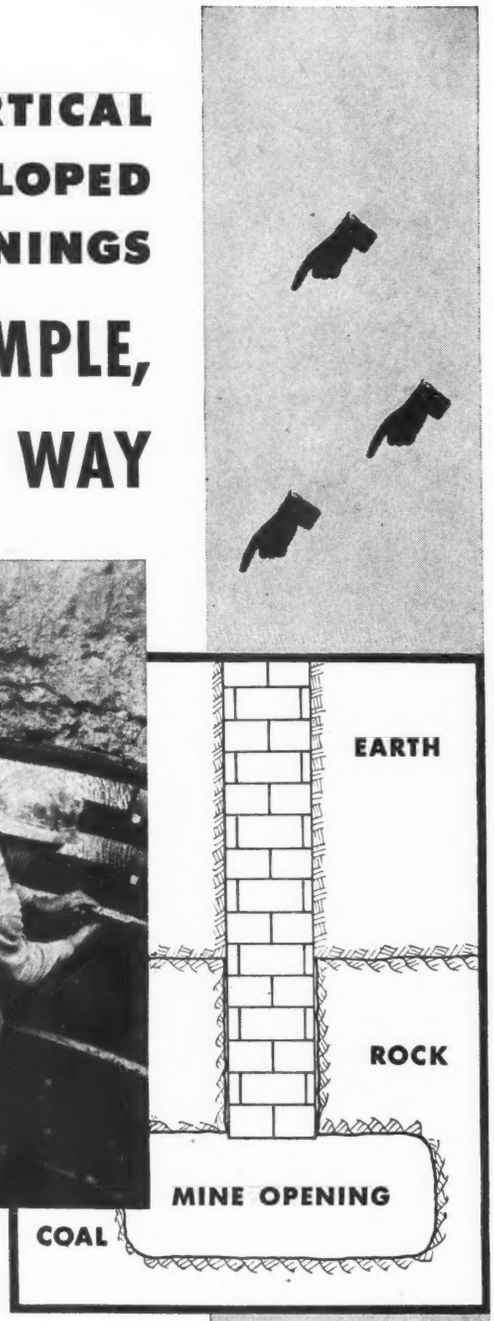
BUILD VERTICAL OR SLOPED OPENINGS

THIS SIMPLE, SPEEDY WAY



Air shafts and escapeways are built quickly and economically with ARMCO Tunnel Liner Plates.

Here's an easy, economical way to provide ventilation and safety as active workings extend from original mine openings. Simply use ARMCO Tunnel Liner Plates to sink new shafts.

These plates are amply strong and provide worth-while durability and safety from fire hazards. One man easily handles the light-weight steel sections, bolting them together with regular wrenches. Costs are low and the job is speeded.

You'll find ARMCO Tunnel Liner Plates ideal for sloped entries, air shafts, escapeways, substations and overcasts. Write for data on Armco tunneling methods. Armco Drainage & Metal Products, Inc., 1575 Curtis St., Middletown, Ohio.

See the Armco Exhibit at the Coal Show— Booth 409

ARMCO

ARMCO TUNNEL LINER PLATES

Black Diamond Coal Mining Co., Birmingham, Ala.

R. A. Ison has been appointed assistant chief engineer, Red Jacket Coal Corp., Red Jacket, W. Va.

James Muncie, section foreman, Grassy Island colliery, The Hudson Coal Co., has been promoted to the position of special engineer in charge of machine mining, succeeding **Harry Reese,** recently named mine foreman at the company's Baltimore colliery.

Ronald B. Talbert has been appointed assistant mining engineer, Widen mine, Elk River Coal & Lumber Co., Widen, W. Va. Mr. Talbert had returned to the company as a member of the engineering staff, following his Navy service.

L. G. Barber, for the past seven years a member of the company's industrial engineering department, has been appointed assistant superintendent, Mine No. 22, Island Creek Coal Co., Holden, W. Va.

Houston Graham, formerly mine foreman, has been named mine superintendent, Brule Smokeless Coal Co., Otsego, W. Va., succeeding **T. H. Caudill.**

Brinton C. Bell Jr. has been appointed regional manager, Coal Heating Service Division, National Coal Association, for the States of Virginia, Maryland and North Carolina. Mr. Bell has had a long experience in the coal retail, stoker and heating industries.

John A. Garcia, Madrid, N. M., has been appointed New Mexico State mine inspector, succeeding Warren Bracewell of Albuquerque, deceased.

Arlie Bragg has returned from war service to resume his duties as mine foreman, Mine No. 97, Consolidation Coal Co. (W. Va.), Rivesville, W. Va. As a chief petty officer in the Sea Bees, he saw service in various parts of the Pacific.

Herbert Fields has been appointed outside plant electrician at the Island Creek Coal Co. Mines Nos. 24, 25 and 26 in Mingo County, West Virginia.

Daniel A. Zupa, field representative for the Anthracite Institute in the Westchester County, New York, area, has resigned, effective April 1.

W. J. Graham, general manager, has also been named president, Intercolonial Coal Co., Westville, Nova Scotia, succeeding **C. A. Paterson,** retired. **W. H. Clarke,** of Montreal, has been elected a vice president of the company.

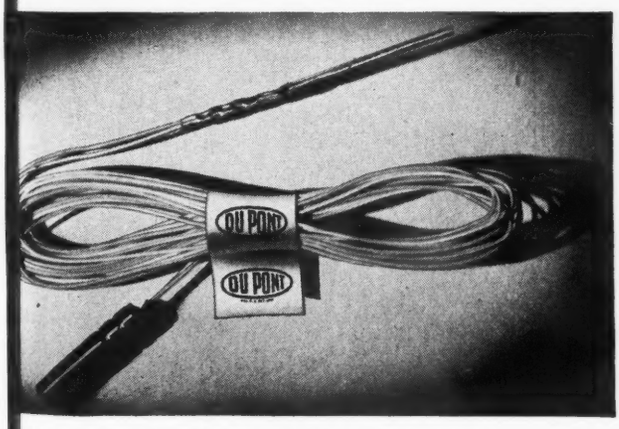
Howard J. Thomas has resigned as SFA area distribution manager at Birmingham, Ala., to resume his coal-mining consulting practice in the Bir-

Three coal getters to help you

GET MORE COAL —FASTER

"NITRAMON" produces excellent fragmentation in typical 17-hole blast with 40-foot over-burden at western Pennsylvania stripping operation.

"MONOBEL" AA allows foreman to inspect face less than ninety seconds after shot in West Virginia mine. Good fumes speed return of crews.



DU PONT ELECTRIC BLASTING CAPS are renowned for dependability. And remember—the most dependable detonator is the safest detonator.

For stripping operations Du Pont "Nitramon" is the ideal blasting agent because it is the safest. It cannot be detonated by the strongest blasting caps, open flame, friction, Primacord or even the impact of rifle bullets. And yet, "Nitramon" Primer dependably detonates the charge. "Nitramon" is easy to handle, and the sturdy, water-tight metal containers may be loaded well in advance of firing . . . whether conditions are wet or dry.

For underground mining Du Pont "Monobel" AA is the largest-selling permissible. Its water resistance gives good results even when the going is very wet. Its slow, heaving action puts large lump within easy reach of mechanical loaders. It is particularly suited for high, hard-shooting seams. Doesn't shatter the coal . . . shears face and ribs clean and square . . . and fumes are Class A.

For both above and below ground Du Pont Electric Blasting Caps help reduce risk of misfires resulting from current leakage and also possess maximum water-resistance . . . features provided by nylon-insulated wires and rubber plug closures.

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See these *and other dependable Du Pont products at the Du Pont Exhibit (Booth 513) at the American Mining Congress Exposition, Cleveland, May 12-15.*

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DU PONT { **"NITRAMON" • "MONOBEL" AA ELECTRIC BLASTING CAPS**

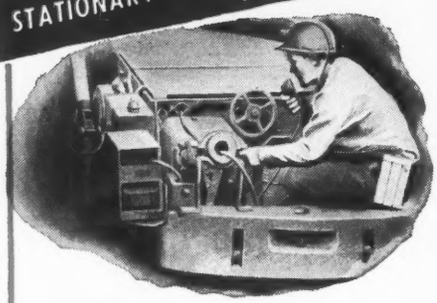
Products of Du Pont Explosives Research

For men who mine

NEW *Femco* TROLLEY-PHONE

YOU TALK BETWEEN A DISPATCHER'S OFFICE

AND AS MANY MOVING OR STATIONARY LOCATIONS AS YOU NEED



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AUTOMATIC VOLUME CONTROL—YOU TALK IN A NATURAL VOICE REGARDLESS OF DISTANCE.

EVERYONE CAN USE IT. EVERYONE LIKES TO USE IT.

- SAVES TIME
- SAVES MONEY
- PROMOTES SAFETY

Small compact design of equipment permits installation anywhere.

Designed and engineered for heavy duty.

All plug-in units for ease of servicing.

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Before we sell it—we want you to be sure you can use it to ADVANTAGE! 'Phone, write or wire for further details.

Guaranteed for three months

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mingham and Chattanooga, Tenn., areas. From 1930 until entering government service in 1943, Mr. Thomas served as consultant to a number of mining firms and the Alabama Mining Institute. He was associated with the Sloss-Sheffield Steel & Iron Co. from 1913 until 1930, lastly as general superintendent of mines. **Thomas B. Long,** field distribution representative in the SFA Birmingham office, has been appointed to succeed Mr. Thomas.

James H. Pierce, president, Pierce Management, Scranton, Pa., has been elected to the board of directors of International Textbook Co., International Correspondence Schools, and International Correspondence Schools of Canada, Ltd.

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Obituary

Robert C. Hill, 77, who retired last year as chairman of the board of the Pittsburgh Consolidation Coal Co. after 53 years of active service in the coal industry, died Feb. 28 at his home in New York. Mr. Hill was a founder of Madeira Hill & Co. and served as a vice president from 1894 to 1928. From 1928 to 1945 he was associated with the Consolidation Coal Co. in the several capacities of president, receiver and chairman of the board, and upon its consolidation with the Pittsburgh Coal Co. became chairman of the new organization.

Robert C. Hill

Norman B. Gurley, 56, chief engineer for the Lando Coal Corp. and affiliates, died Feb. 27 in a Huntington, W. Va., hospital, following a heart attack. Prior to joining the Lando organization, Mr. Gurley had been associated with the West Virginia Steel & Mfg. Co. and the Red Jacket Coal Corp. and previously served as a consulting engineer in the Williamson field. He was an immedi-

COAL USERS ARE SOLD ON

Clean Coal-

ARE YOU?

Clean coal means more value for your customers—and they know it! Industrial users . . . railroad . . . power plants—all of the important markets realize that properly prepared coal delivers more heat and power per ton. These users are asking for correctly processed coal now and their demands for coal of uniform chemical and physical quality will continue to increase. Make certain that your preparation methods are keeping pace with the changing market!

FAIRMONT MACHINERY CO., situated in the heart of the Appalachian coal fields for forty-five years, "lives with coal".

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In Your Cleaning Plant
(and anywhere else desired)

YOU CAN

WEIGH and RECORD WHILE CONVEYING

without stopping the conveyor

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Get both passing and

TOTAL WEIGHT

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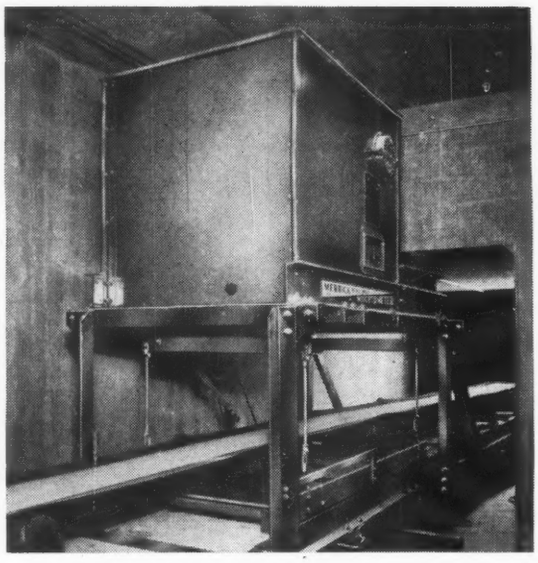
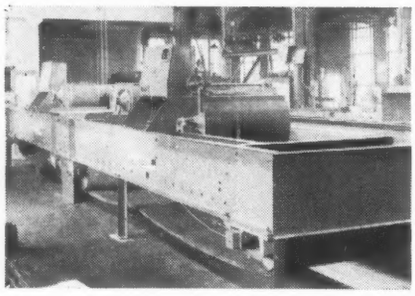
At location or distant site



USE THE MERRICK WEIGHTOMETER

YOU don't have to take apart your conveyor to install or to operate a Merrick Weightometer. Quickly installed in any desired location. Then, without interrupting conveyor movement, you get an automatic accurate weight, and total weight, at location point—or any distant spot in the mill. Made in sizes to meet all tonnage requirements. Operates equally well on horizontal or inclined conveyors. Let us tell you about its many successful installations. Bulletin CA-375.



THE MERRICK "FEEDOWEIGHT"

Another Merrick product. Used to proportion various grades of coal. Invaluable for coal blending, feeding coal to coke ovens and other process work. Controls the Feed rate by Weight, automatically and registers weight. In sizes to meet all tonnage requirements. Bulletin CA-551.

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MERRICK SCALE MFG. CO., PASSAIC, N. J.

MERRICK A GREAT NAME IN WEIGHING WHILE CONVEYING

ate past president of the Huntington chapter of the West Virginia Society of Professional Engineers and was active in many other mining activities.

August F. Whitfield Sr., 85, president, Clover Fork Coal Co., Kitts, Ky., and one of Harlan County's pioneer coal operators, died Feb. 28 at his home. Mr. Whitfield came to Kentucky from Alabama in 1907 and with his brother, Bryan Whitfield Sr., formed the Left Fork Coal Corp. Upon the sale of this firm in 1911, they formed the Harlan Collieries Corp., which in 1919 they divided for individual operation.

Walter B. Crickmer, 64, general superintendent, MacAlpin Coal Co., Charleston, W. Va., died March 17 in a Beckley, W. Va., hospital. He had been associated with the company for 35 years, the last 20 years as general superintendent.

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Association Activities

Independent Anthracite Operators, at its annual meeting last month, re-elected as president, Robert L. Birtley, president, Hammond Coal Co. Also re-elected were: Louis Pagnotti, Pittston, Pa., vice president; Bruce Payne, Wilkes-Barre, treasurer; and L. H. Weichel, Scranton, secretary.

Fairmont Coal Bureau announced March 12 that members had voted to extend the organization for another three years. Julian Tobey will continue as director. Elected to the management committee were: A. C. Spurr, president, Monongahela Power Co., Fairmont; Attorney Frank R. Amos, Fairmont; Earl C. Payne, Pittsburgh; D. T. Buckley, chairman, Bituminous Coal Marketing Commission, Washington; and Howard Zeller, vice president, Jamison Coal Co., Greensburg, Pa.

McGRAW-HILL *World News*

LONDON—The long-discussed 5-day week for British coal miners last month was made official by the Government, effective the first Monday in May. Miners will be paid for the sixth day's work provided they work five full shifts during the week. The only excuses to be accepted for paying for the sixth day when the full five days is not worked are an injury while at work, performance of trade-union work or a task assigned by the Coal Board. As a part of the agreement, the miners consented to the use

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RED CROWN HAS 6 IMPORTANT ADVANTAGES

1. **Red Crown is easy on the roof.**
2. **Slow heaving and spreading action with results similar to those obtained with the use of black powder.**
3. **Power distributed evenly throughout the face of the cut.**
4. **Coal displaced in firm, hard lumps means less degradation.**
5. **Red Crown, containing no nitroglycerine, is the non-headache permissible.**
6. **Less smoke and fumes mean less down time for expensive equipment.**

WE WANT TO SHOW YOU RED CROWN IN ACTION. Let us arrange a trial in your mine, under your particular operating conditions. Then you can see for yourself Red Crown's many advantages. There is no obligation—all you need do is write or phone us—we'll do the rest. Why not today?

THE KING POWDER COMPANY, INC., CINCINNATI 1, OHIO

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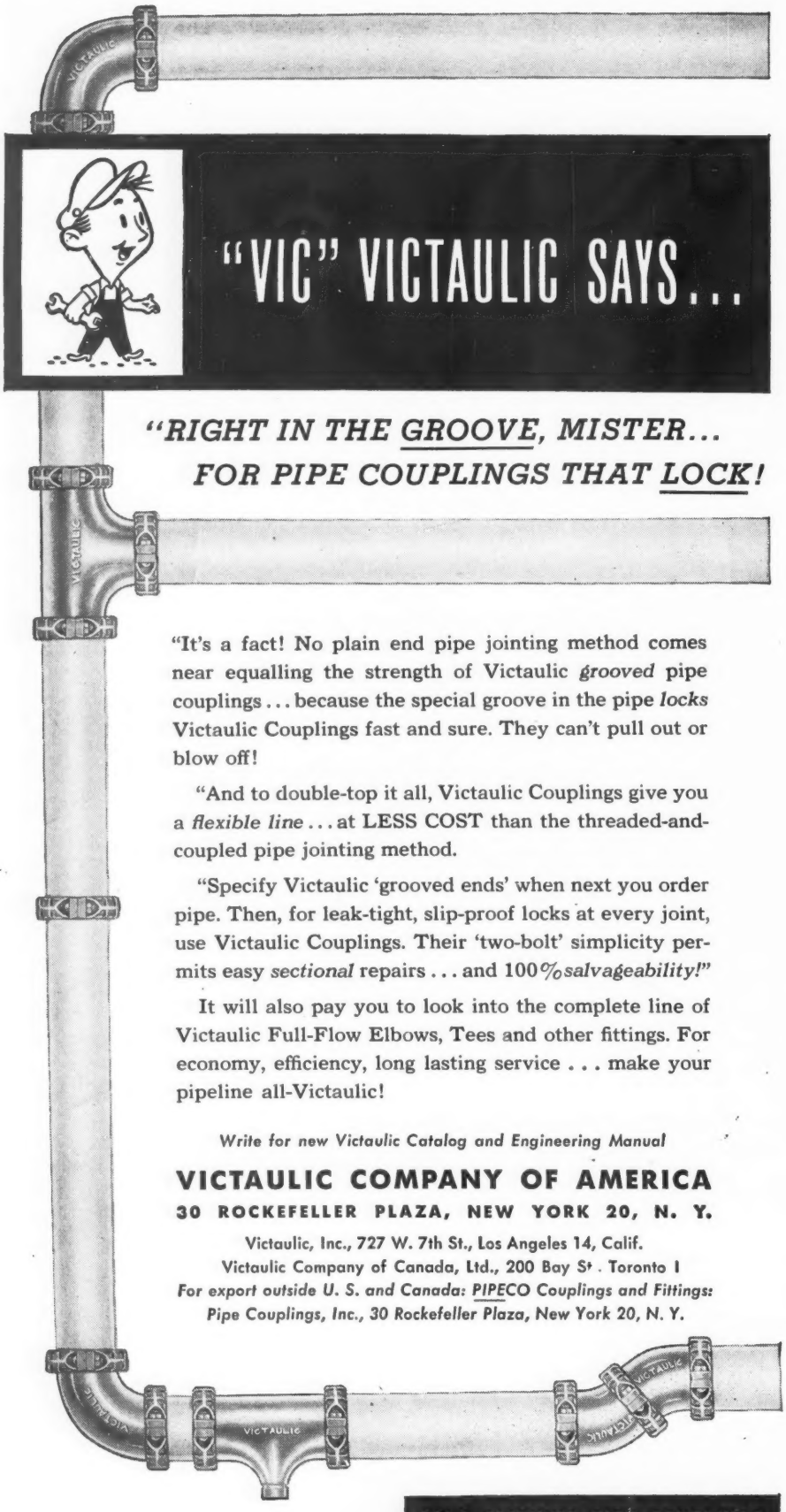

"VIC" VICTAULIC SAYS...
"RIGHT IN THE GROOVE, MISTER...
FOR PIPE COUPLINGS THAT LOCK!
"It's a fact! No plain end pipe jointing method comes near equalling the strength of Victaulic grooved pipe couplings... because the special groove in the pipe locks Victaulic Couplings fast and sure. They can't pull out or blow off!
"And to double-top it all, Victaulic Couplings give you a flexible line... at LESS COST than the threaded-and-coupled pipe jointing method.
"Specify Victaulic 'grooved ends' when next you order pipe. Then, for leak-tight, slip-proof locks at every joint, use Victaulic Couplings. Their 'two-bolt' simplicity permits easy sectional repairs... and 100% salvageability!"
It will also pay you to look into the complete line of Victaulic Full-Flow Elbows, Tees and other fittings. For economy, efficiency, long lasting service... make your pipeline all-Victaulic!
Write for new Victaulic Catalog and Engineering Manual
VICTAULIC COMPANY OF AMERICA
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.
Victaulic Company of Canada, Ltd., 200 Bay St. Toronto 1
For export outside U. S. and Canada: PIPECO Couplings and Fittings: Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.
Have you considered Victaulic for your piping requirements?
Sizes—¾" through 60"
SELF-ALIGNING PIPE COUPLINGS
VICTAULIC
EFFICIENT FULL-FLOW FITTINGS
Copyright 1947, by Victaulic Co. of America

of displaced persons in the mines. The miners' union pledged full cooperation and assured the Government that no coal production would be lost as a result of the shorter working week. Average pay of the British miner has been running less than $28 weekly.

MELBOURNE—A new strip-mining project to cost up to $47,000,000 and to tap 122,500,000 tons of brown coal is being considered by the Victorian Cabinet. Submitted by the Victorian State Electricity Commission, the proposal visualizes development of new fields in South Gippsland, where the coal seam averages 380 ft. in thickness beneath an overburden of 43½ ft. It is believed that coal can be mined to a depth of 320 ft. from five working faces to be developed gradually.

The Electricity Commission's report recommends expansion of Victorian coalfields to produce 8,000,000 tons of raw brown coal yearly by 1961-62. Production from the new strippings, with that from the present working at Yallourn, would be about 1,300,000 tons of briquets a year. Two new briquet factories are proposed, one to come into operation in four years' time, and the second in eight years. Legislation is recommended to require fuel consumers to use brown coal or briquets produced by the Commission. Recently the Victorian Government placed in Germany, orders for two huge dredges for use in Government-controlled strip-coal mines.

Moscow—Close to 500,000,000 c.m. of water has been pumped out to date from the Donbas mines, which the Germans wrecked and flooded during their retreat, the Ministry of the Coal Industry of the Western Areas has disclosed. An additional 150,000,000 c.m. still remains to be drained.

Containing a total accumulation of subterranean waters that could fill a lake covering an area of 70 sq. km. 10 meters deep, the mines at first did not present a hopeful picture and it seemed as though draining the underground workings would require many years. But in reality, it was pointed out at the ministry, the pace hit by Soviet miners has been much faster than was attained by French colliers during the rehabilitation of the mines in northern France which had been flooded by the Germans in the first world war.

By now the water has been fully drained out of 70 percent of all the Nazi-damaged collieries. Pumping installations in the Donbas can handle as much as 120,000 cubic meters of water per hour.

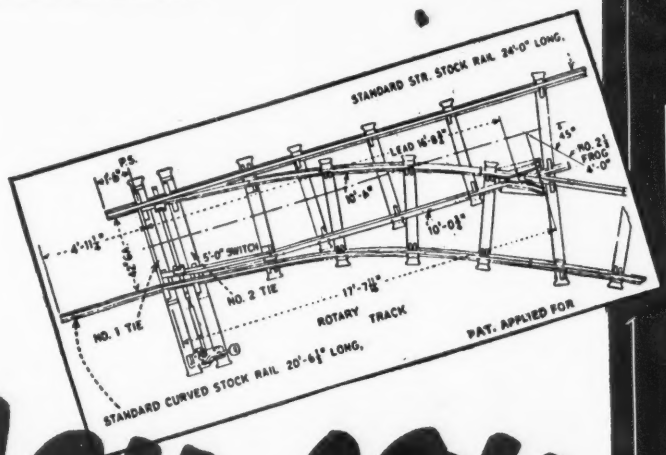
The coal industry ministry plans to complete the draining of the mines in 1948. Though the remaining part of the job is smaller in volume than that accomplished to date, it is by far the hardest. Heretofore, efforts and equipment were concentrated on reviving those mines which suffered less dam-

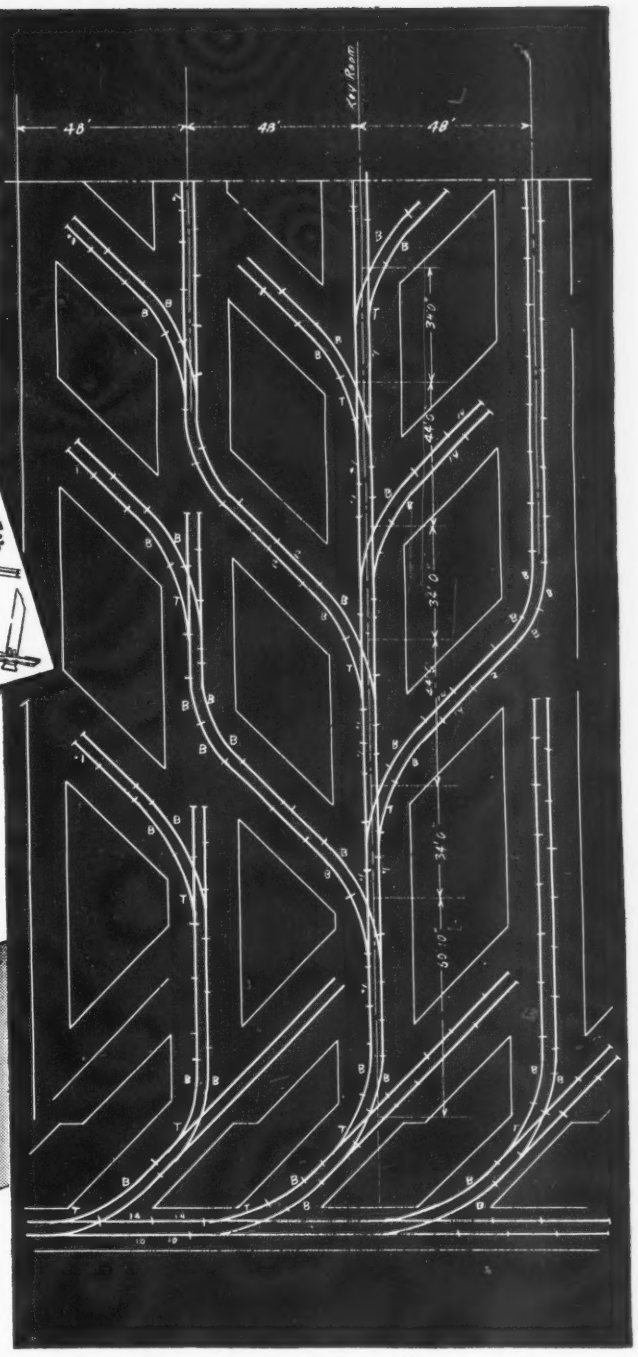
At right, a mine layout such as can be planned by you on paper, produced in standard prefabricated sections by WEST VIRGINIA and delivered to you ready to be installed! The only track tools you'll need are a wrench, a hammer and a blueprint!

In an actual installation three men moved WEST VIRGINIA Prefabricated Track from 1½ rooms and delivered it to a new location in one shift—proof that this method saves time and helps you produce more coal per shift.

The layout shown herewith uses our universal turnout which, including the stock rail, can be used for either right hand or left hand installations. We have so far simplified prefabricated track that this layout, except for the turnouts, requires only three different lengths of straight rails and one length of curved rail.

Visit our booth, number 1312, at Cleveland . . . let us show you a working model of WEST VIRGINIA Prefabricated Track and explain its uses and economics.





You can lay WEST VIRGINIA PREFABRICATED track faster

Send us a rough drawing, showing what you want in your panel layout. We'll be glad to demonstrate the advantages of using WEST VIRGINIA Prefabricated Track.

Help Yourself

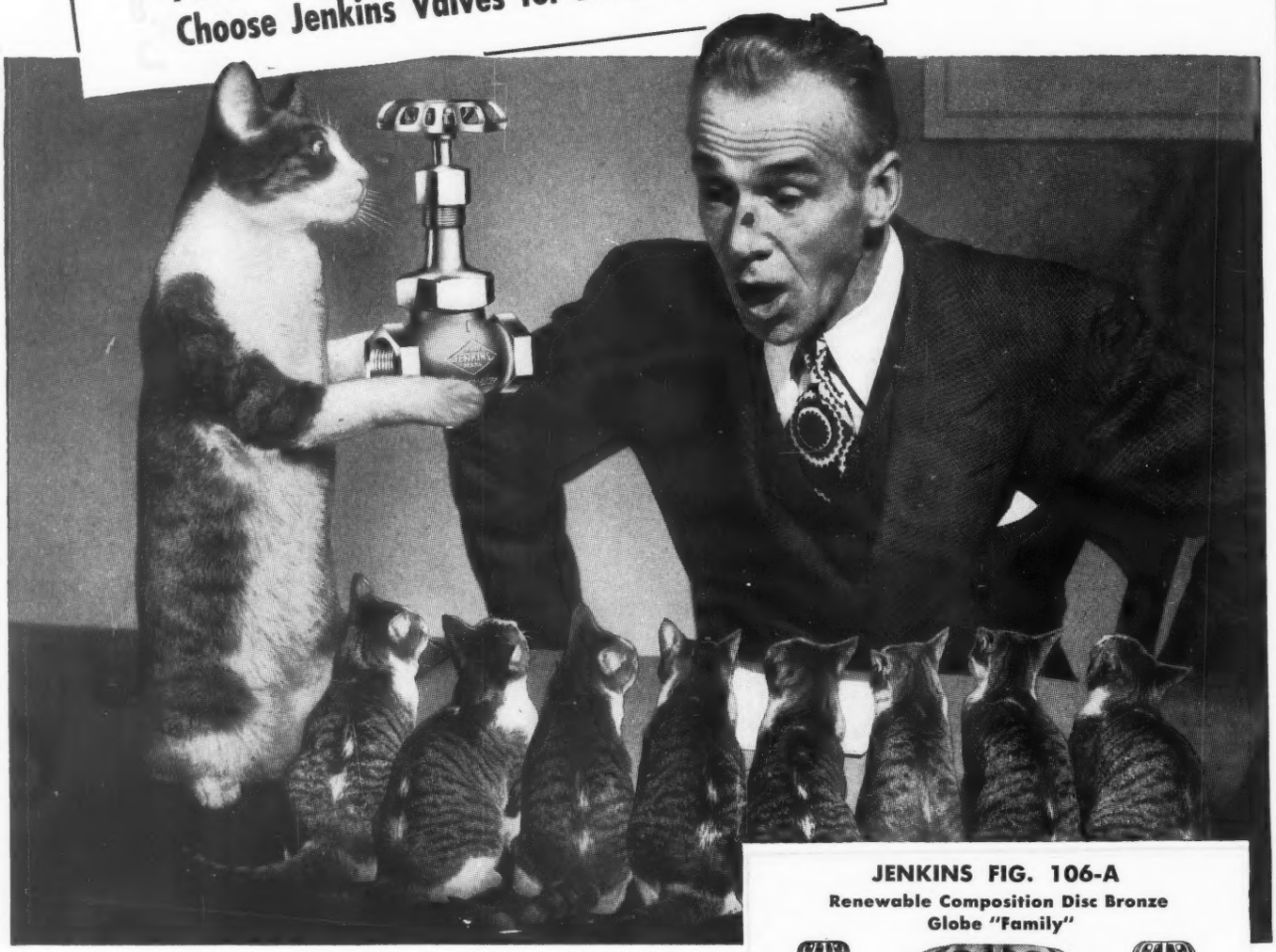
by assisting in any way possible the movement of surplus billets, rerolling rails and scrap to the mills. All are greatly needed to continue the manufacture of steel items that you need.

WEST VIRGINIA STEEL & MFG. COMPANY

Formerly The West Virginia Rail Company

HUNTINGTON (1) WEST VIRGINIA

Use the right type valve for the service
Place valves correctly in the line
Choose Jenkins Valves for lifetime economy



Only Valves with 9 Lives will keep today's Maintenance down

To make sure of extra-long valve life and minimum valve maintenance, follow this simple A-B-C formula.

By choosing Jenkins Valves, you get the accumulated experience of nearly 100 years of valve manufacturing. Countless records prove that Jenkins advanced design, better materials, and better workmanship pays off in lower overall valve costs.

You also get expert counsel of top-notch valve specialists, Jenkins Engineers, whenever you need help on valve selection or placement. *For lowest cost in the long run,* follow this formula . . . choose Jenkins Valves. *Jenkins Bros., 80 White Street, New York 13; Bridgeport; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros. Ltd., Montreal, Canada.*

SINCE 1864

JENKINS VALVES

For every Industrial, Engineering, Marine, Plumbing-Heating Service . . . In Bronze, Iron, Cast Steel and Corrosion-resisting Alloys . . . 125 to 600 lbs. pressure

Sold Through Reliable Industrial Distributors Everywhere

JENKINS FIG. 106-A

Renewable Composition Disc Bronze Globe "Family"

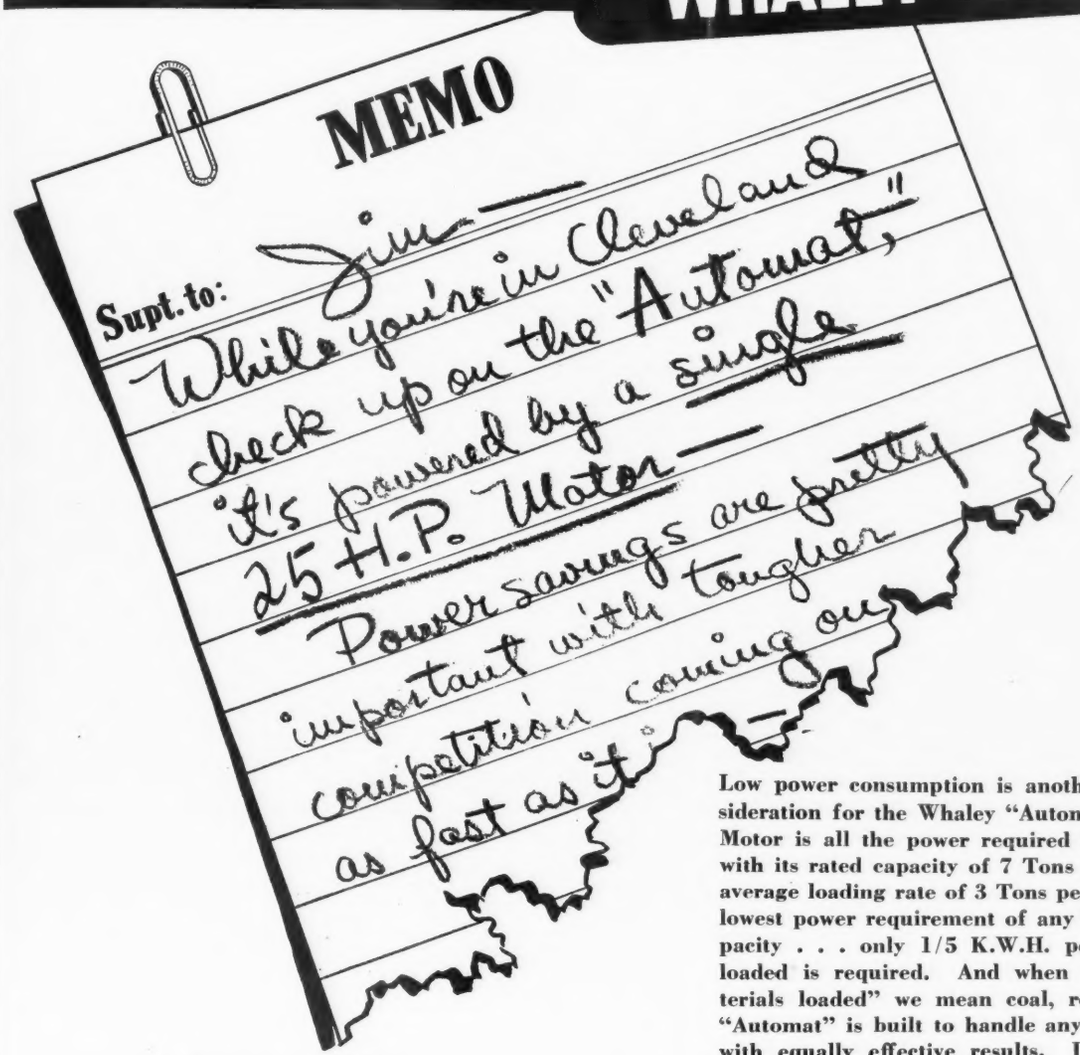
Change body for Globe or Angle.
Change disc nut for throttling — also spindle for Stop and Check.
150 S
TRADE JENKINS MARK
Change trim, add spring as desired, for Lift Check.
150 lbs. steam 300 lbs. O.W.G
Change spindle for Quick Opening.

The Fig. 106-A "family" permits valve combinations for 90% of industrial needs through interchangeability of parts. With only four body types and a handful of parts, 18 different types of valves can be assembled. Equipped with the slip-on stay-on disc holder, Fig. 106-A can be restored to good-as-new service in a few minutes.

ONE OF OVER 600 EXTRA VALUE VALVES MADE BY JENKINS VALVE SPECIALISTS

ROCK BOTTOM POWER COSTS

—Another reason why you need the WHALEY "AUTOMAT"

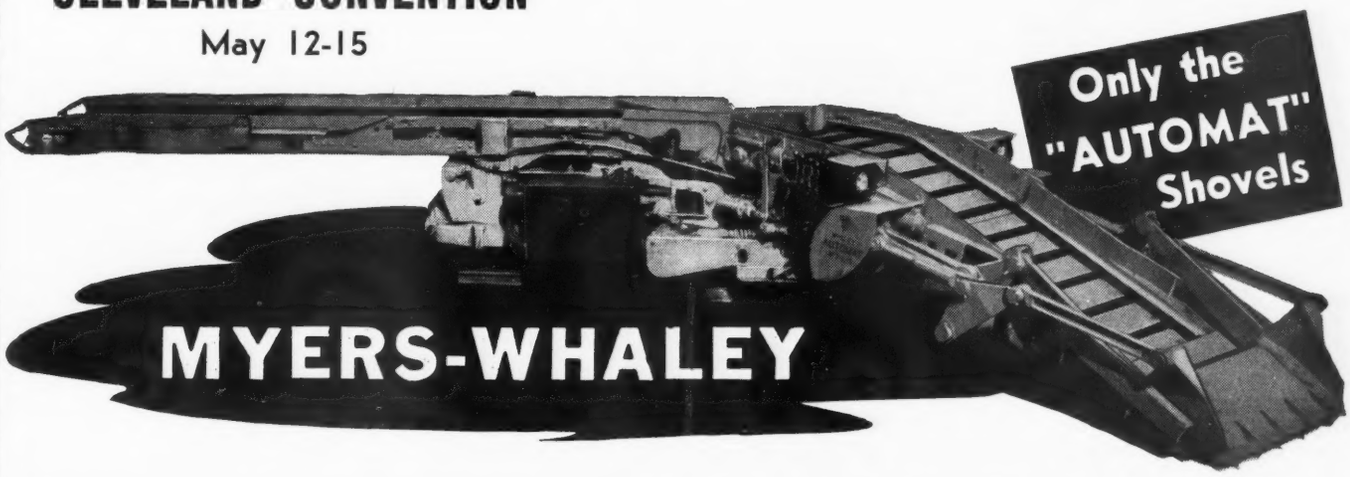


Low power consumption is another worthwhile consideration for the Whaley "Automat." One 25 H.P. Motor is all the power required for the "Automat" with its rated capacity of 7 Tons per minute and an average loading rate of 3 Tons per minute. With the lowest power requirement of any loader of equal capacity . . . only 1/5 K.W.H. per ton of material loaded is required. And when we speak of "materials loaded" we mean coal, rock or slate. The "Automat" is built to handle any of these materials with equally effective results. Let us furnish you complete details. Myers-Whaley Co., 147 Proctor, Knoxville, Tenn.

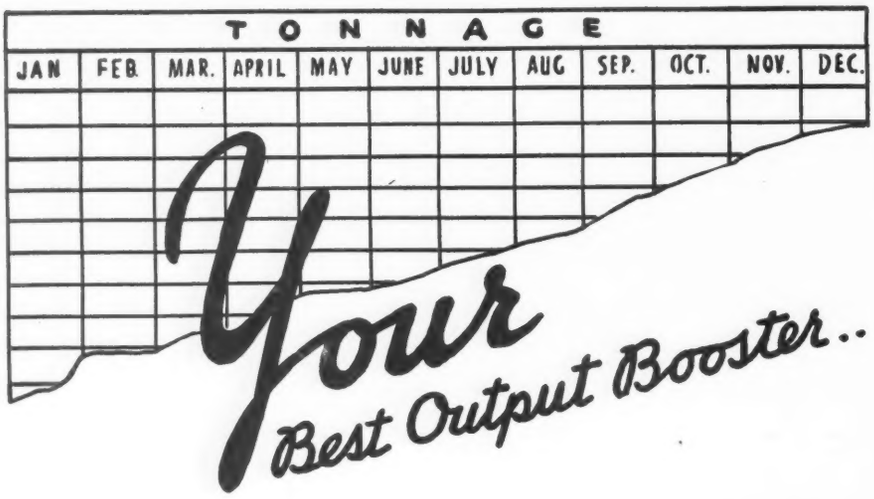
Meet us at the

CLEVELAND CONVENTION

May 12-15



Mechanical Loaders Exclusively for Over 39 Years



FRESH AIR AT THE WORKING FACES

ABC products provide the most dependable and economical means of delivering a continuous supply of fresh air to the working zones; enabling the men to get out more coal. ABC has had a definite share in making the tonnage per man in American coal mines so much greater than that obtained in foreign coal mines.

ABC JUTE BRATTICE CLOTH assures more fresh air for the men by sealing off inactive areas and directing the air flow to the sections being worked. Treated with non-injurious chemicals to resist flame, fungi and shrinkage, ABC Brattice Cloth gives long service under mine conditions. This rugged fabric is available in two grades.

MINEVENT TUBING increases output by delivering fresh air right where it is needed, without waste. Patented couplings and hangers facilitate installation or removal. Made in three grades of tough material that withstands handling, flame, fungi, leakage and shrinkage.

Write for samples and full information.

ABC Brattice at end of conveyor; pulled aside to permit passage of car.

See our exhibit: Space No. 119; American Mining Congress and Coal Exposition Convention; Cleveland, May 12-15.

A B C AMERICAN
BRATTICE CLOTH CORP.
WARSAW, INDIANA

age. The pumping of water is to be started this spring for the mines where the damage has been greatest.

CAPE TOWN—The Union Government will introduce legislation this year to clear the way for the establishment of an oil-from-coal industry. Details of the bill are not available, but it is understood the government will not finance the industry itself, but probably will protect it in the early stages from unfair competition and supervise its development because of its economic and strategic importance.

It is estimated that $32,000,000 initial capital would provide a plant capable of producing 75,000,000 gal. a year. At present only coal with high calorific values is mined, the lower grade seams being untouched. in the new industry as well as in Millions of tons of low-grade coal, for which there is no sale, could be used chemical and other subsidiary industries.

•

Preparation Facilities

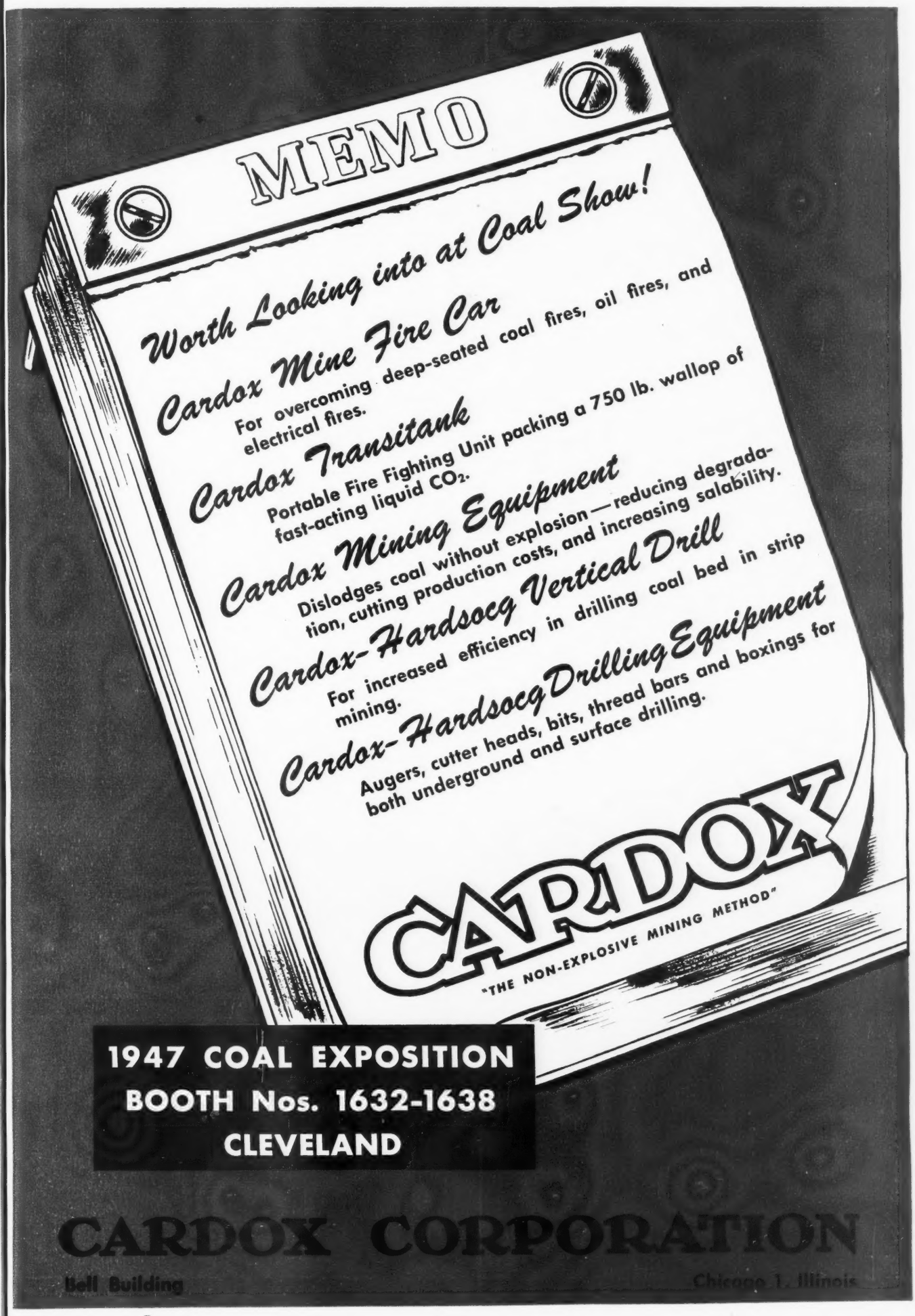
Equitable Fuel Corp., Audenreid, Pa.—Contract closed with Deister Concentrator Co. for 14 No. 7 Super-Duty Diagonal-Deck coal-washing tables and three Concenco revolving-feed distributors, for cleaning barley and Nos. 4 and 5 buck.

Brule Smokless Coal Co., Otsego, W. Va.—Contract closed with Kanawha Mfg. Co. for redesign of existing tipple and cleaning plant; mine-run to be brought to tipple by extension of underground conveyor spanning Slab Fork Creek on steel gallery; facilities to be added for picking and cracking lump to egg size and for washing egg in Kanawha-Belknap washer at 40 t.p.h.; middlings from washer to be crushed and recirculated.

Johnstown Coal & Coke Co., Logan No. 8 mine, Ruthford, Pa.—Contract closed with Kanawha Mfg. Co. for complete new dumping, cleaning and loading plant, capacity, 200 t.p.h.; coal from drop-bottom cars delivered on inclined belt conveyor to tipple; facilities for loading four sizes together, with provision for reassembling and modifying sizes; nut and pea to be washed separately in Kanawha-Belknap washers and loaded separately or reassembled with other sizes; provision for cracking and recirculating lump when not loaded.

Central Indiana Coal Co., Plainville, Ind.—Contract closed with Deister Machine Co. for three No. 16 Deister Plat-O coal-washing tables to handle 3/16x0-in. undersized coal from rising screen; capacity, 15 t.p.h. each.

U. S. Bureau of Mines, Missouri

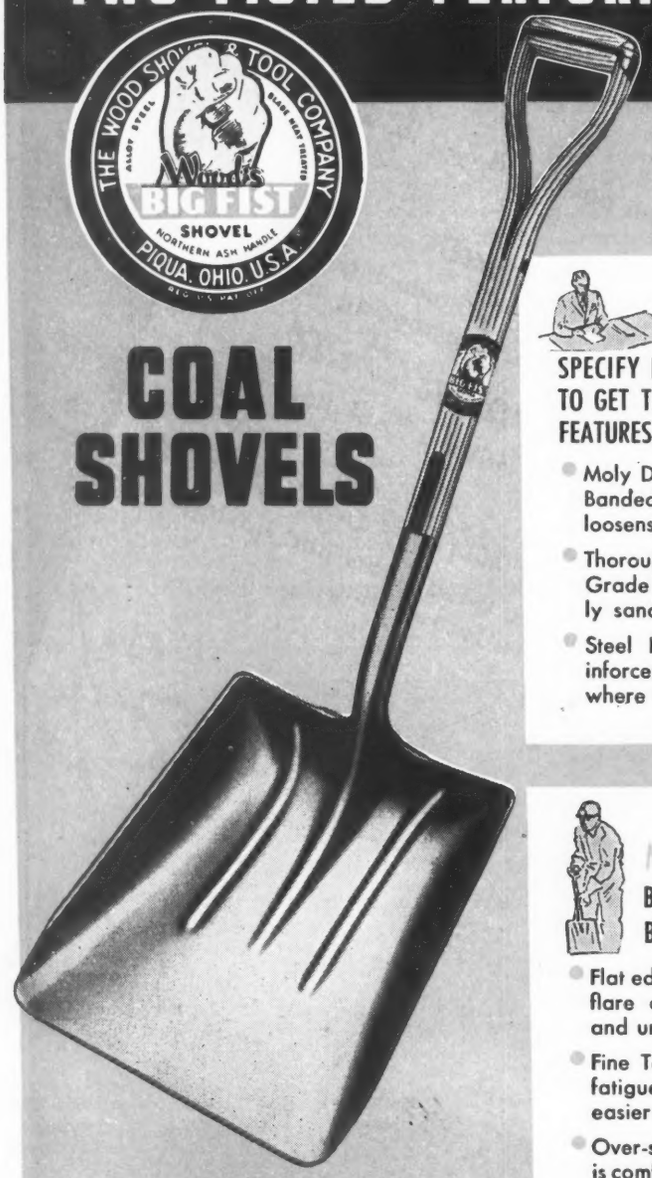

MEMO
Worth Looking into at Coal Show!
Cardox Mine Fire Car
For overcoming deep-seated coal fires, oil fires, and electrical fires.
Cardox Transitank
Portable Fire Fighting Unit packing a 750 lb. wallop of fast-acting liquid CO_2.
Cardox Mining Equipment
Dislodges coal without explosion—reducing degradation, cutting production costs, and increasing salability.
Cardox-Hardsocg Vertical Drill
For increased efficiency in drilling coal bed in strip mining.
Cardox-Hardsocg Drilling Equipment
Augers, cutter heads, bits, thread bars and boxings for both underground and surface drilling.
CARDOX
"THE NON-EXPLOSIVE MINING METHOD"
1947 COAL EXPOSITION
BOOTH Nos. 1632-1638
CLEVELAND
CARDOX CORPORATION
Bell Building
Chicago 1, Illinois

BIG FEE

TWO-FISTED PERFORMANCE

THE WOOD SHOVEL & TOOL COMPANY
ALLOY STEEL — BLADE HEAT TREATED
Wood's BIG FIST SHOVEL
NORTHERN ASH HANDLE
PIQUA, OHIO, U.S.A.

COAL SHOVELS



SMART BUYERS
SPECIFY BIG FIST SHOVELS TO GET THESE EXTRA VALUE FEATURES.

- Moly D Handle with Steel Banded Grip. Grip never loosens, checks or splits.
- Thoroughly seasoned XX Grade handles. Thoroughly sanded and waxed.
- Steel I-Beam Handle Reinforcement. Strengthens where most breaks occur.

MINERS PREFER BIG FIST SHOVELS BECAUSE

- Flat edge and wide curved flare of blade gets into and under coal.
- Fine Tool Balance lessens fatigue because shovel is easier to work with.
- Over-sized Moly D Handle is comfortable to any hand regardless of size.

THE WOOD SHOVEL AND TOOL CO., Piqua, Ohio

A National Organization Specializing Exclusively in
SHOVELS SPADES SCOOPS

Ordnance Works, Louisiana, Mo.—Contract closed with Roberts & Schaefer Co. (as sub-contractors) for preparation plant at the Hydrogenation Demonstration Plant, capacity, 75 t.p.h.; to include raw-coal unloading, crushing, pulverizing, heat drying and delivery to pasting plant.

Gloroga Coal Co., Blue Pennant, W. Va.—Contract closed with Roberts & Schaefer Co. for complete coal preparation plant, capacity, 400 t.p.h., run-of-mine; lump coal to be hand picked; 6x1¼-in. to be wet-washed in Hydro-Separators and 1¼x0-in. to be air-cleaned in Stump Air-Flow units.

Wyoming Mining Corp., Lynco, W. Va.—Contract closed with Roberts & Schaefer Co. for complete tipple including headhouse with revolving dump and car feeders, rope-and-button conveyor, Marcus picking-table screens and loading booms, and Hydro-Separator wet-washing equipment for cleaning 6x¼-in. coal; capacity, 250 t.p.h.

Island Creek Coal Co., Mine No. 24, Delbarton, W. Va.—Contract closed with Roberts & Schaefer Co. for complete wet-washing plant; hydrotator, classifer equipment for ¼x0-in. coal, Bird filters and Raymond flash dryers for drying coal; capacity, 75 t.p.h.

Willeck Coal Co., Ann Jean, W. Va.—Contract closed with Jeffrey Mfg. Co. for coal washery; capacity, 175 t.p.h. raw-coal feed, run-of-mine.

Raymond Wren, Dornsife, Pa.—Contract closed with Deister Concentrator Co. for six No. 7 SuperDuty Diagonal-Deck coal-washing tables to handle Nos. 4 and 5 buck coal.

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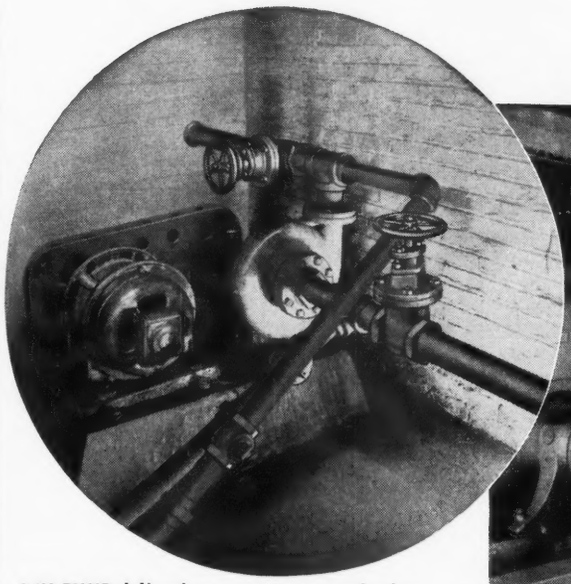
Coal Publications

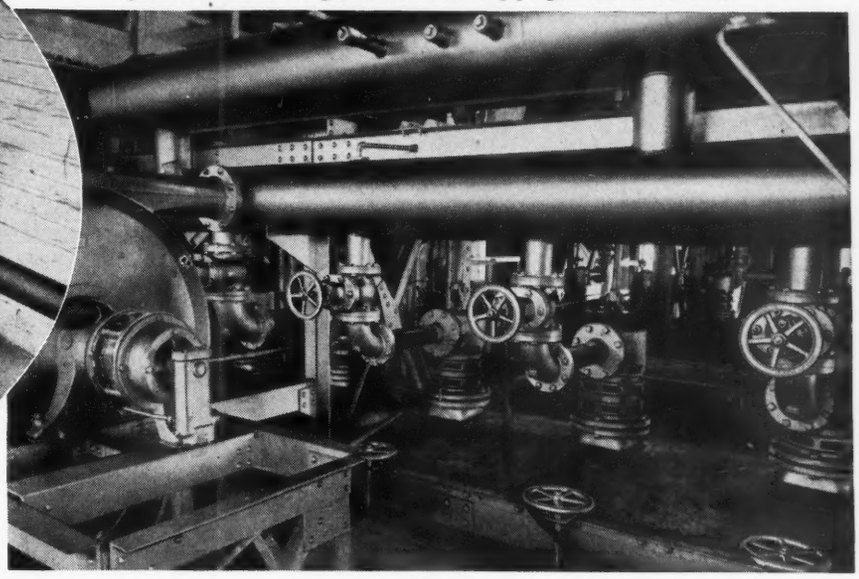
Coal Driers, by F. H. Reed, L. D. Schmidt and others (PB-28744). Office of Technical Services, Department of Commerce, Washington 25, D. C.; 1946. 6 pp.; photostat, $1; microfilm, $1. A report by British and American investigators on a German turbine-type coal drier. The machine is designed for minus 1½-in. coal and is 30 ft. high and 15 ft. in diameter. It is said to dry 50 to 60 tons per hour, using steam at 120-130 deg. C. or combustion gases at 220-250 deg. C.

Missouri Basin Studies No. 1: Four Maps—Part I, Metallic Mineral Resources; Part II, Non-Metallic Mineral Resources; Part III, Fuel Resources; Part IV, Construction Materials. Director, Geological Survey, Washington 25, D. C.; 1946. Single maps, 40c.; set of four, $1.50. Part III shows a location of all oil and gas field and oil-shale and coal deposits in the Missouri Valley, with inserts showing location of pipelines, refineries and gasoline plants, coal and oil production by counties and



3-IN. PUMP *delivering water to sprays of mine air conditioning system. All piping equipment for the installation is in the Crane line.*

WET CLEANING PLANT *showing air supply lines from centrifugal compressors to coal washing system. Valves and piping materials are Crane.*



Everything for your Piping Job ...from one complete line

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RESPONSIBILITY
STANDARD OF QUALITY

Getting the equipment you need . . . and the quality you want... that's step No. 1 of any piping project. And there's where the *complete* Crane line begins to simplify every step of your job . . . from design to erection to maintenance.

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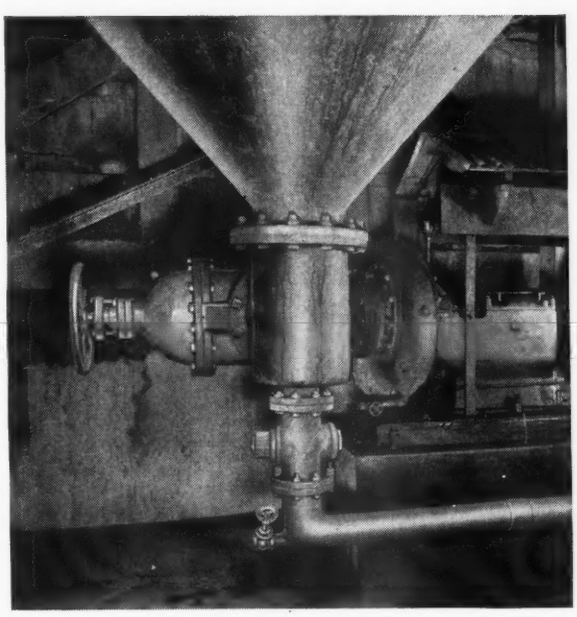
ONE SOURCE OF SUPPLY offering the world's largest selection of steel, iron, and brass piping materials for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials—helping you to get the best installation, and to avoid needless delays on jobs.

OUTSTANDING QUALITY in every item—assuring uniform dependability and durability in every part of piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas.



COAL WASHING *water circulating pump with Crane 12-in. iron body wedge gate valve on inlet line. One order to Crane covers all piping for this hookup.*

EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

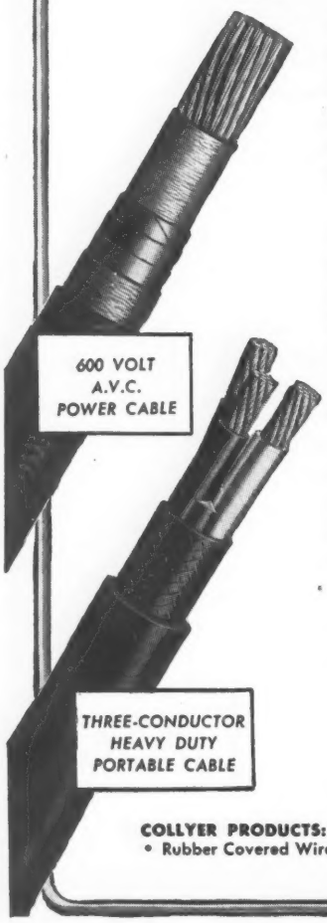
PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

Collyer

POWER CABLES . . . PORTABLE CABLES

FOR SAFETY AND RUGGED SERVICE



600 VOLT A.V.C. POWER CABLE

THREE-CONDUCTOR HEAVY DUTY PORTABLE CABLE

Under conditions where ordinary insulations fail . . . where heat and flame are a constant menace, and overloaded circuits may be expected . . . there Collyer A.V.C. Power Cables and Collyer Neoprene Sheathed Portable Cables give outstanding service.

Collyer A.V.C. Power Cables for permanent installations resist flame, heat, fumes, oil, grease, and abrasion. They are built for continuous operation at high temperatures up to 230°F and voltages to 7500. Layers of resin-impregnated felted asbestos, heat-resisting varnished cambric, and rugged asbestos braids adapt this cable to the most severe service.

Collyer Heavy Duty Neoprene-Sheathed Cables for portable use have maximum flexibility for constant reeling and unreeling. The lead-cured neoprene jacket meets the State of Pennsylvania requirements for flame resistance and is highly resistant to chemicals, oil, and physical abuse. Available in single and multi-conductor.

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COLLYER PRODUCTS: Asbestos and A.V.C. Wires & Cables • Rubber Cords & Cables • Rubber Covered Wires & Cables • Lead Sheathed Cables • Resistol Synthetic Resin Insulated Cables • Varnished Cambric Insulated Cables

gas output by States and Counties.

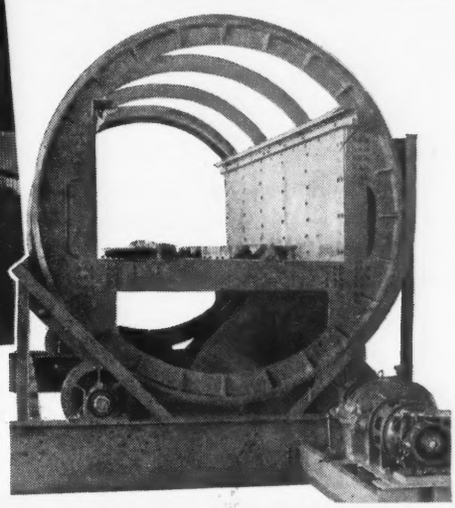
Learning to Weld. Lincoln Electric Co., Cleveland 1, Ohio; 1947. 32 pp., 5½ x 8½-in.; paper; 25c. in U. S., 35c. elsewhere. Primary steps in learning arc welding, with discussions of protective clothing and equipment; welding positions; types of welds; fit-up of parts; fillets in all positions; butt, lap, corner and edge welds; welding cast iron; hard surfacing. Includes illustrations, conversion tables and a glossary.

Washing Characteristics of the Pittsburgh Coal in a High-Sulfur Area in Greene County, Pa., by Thomas Fraser and W. L. Crentz. U. S. Bureau of Mines, T.P. 689. 85 pp. plus 2 pp. of maps; 5⅞x9⅛-in.; paper; 15c., Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. Near-exhaustion of high-quality metallurgical coal in Pennsylvania's steel-manufacturing area necessitates an appraisal of remaining coals. Substantial variations in sulfur content of Greene County coal occur at intervals of as little as 100 ft. Separate handling of low-float sulfur coals from the different working places and washing them at 1.60 specific gravity produces 56.6 percent of run-of-mine at 1.30 percent sulfur content, according to Bureau tests. Separate washing at 1.35 specific gravity, which must await development of an efficient low-gravity process, would increase the theoretical yield of 1.30 percent sulfur content to 69.5 percent of total mine run, leaving the remainder for high-sulfur steam coal.

Information on Coal Mining in Spain, by J. H. East Jr. U. S. Bureau of Mines, I.C. 7396. 27 pp. plus 3 pp. illustrations; 8x10½-in.; paper, mimeo.; free. Statistics, personal observations and other data from official sources on production and preparation in anthracite, bituminous and lignite mining. Recent production increases suggest that Spain probably can be independent of coal imports.

Use of Scrapers and Other Light Earth-Moving Equipment in Bituminous Coal Strip Mining, by L. A. Turnbull, J. J. Shields, J. J. Dowd, E. L. Fish and A. L. Toenges. U. S. Bureau of Mines, R.I. 4033. 37 pp. plus 18 pp. of illustrations and tables; 8x10½-in.; paper, mimeo.; free. Methods at six strip mines as follows: the Lower Kittanning bed in Maryland; the Pittsburgh No. 8 bed in Pennsylvania; and, in West Virginia, three operations in the Pittsburgh No. 8 bed. Overburden ranges from a few feet to a maximum of 60 ft. of soil, clay, shale and limestone. Diesel-powered tractor- and pusher-scrapers, with rated capacities of 12, 15 and 25 cu. yd. usually are used to remove overburden in rolling or hilly areas favorable for disposal of overburden in spoil piles

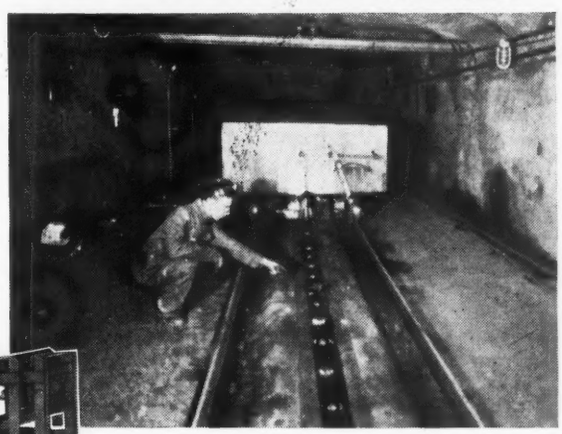
Nolan Rotary Car Dumpers and Trip Feeders
HELP SPEED PRODUCTION
for big West Virginia Operation

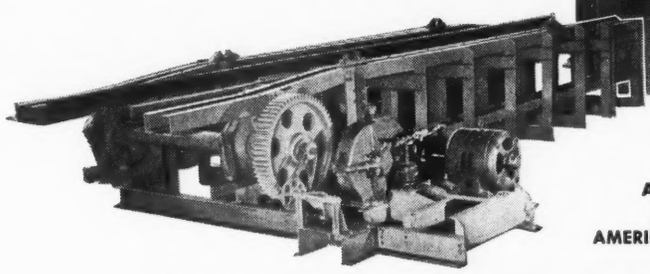


● These three points of superiority of the Nolan Rotary Car Dumper help assure speedy, economical handling of coal in a well-known West Virginia operation: 1. Patented Positive Starting Lug, 2. Patented Positive Rail Aligning Stop, and 3. Heavy Machined Cast Steel Rings.

The Nolan Trip Feeder feeds the trip to the Nolan Rotary Car Dumper at high speed, employing acceleration and deceleration and assuring complete control of the trip at all times. The trip is spotted against the Nolan Car Stop to accurately register the loaded car in the dump for dumping. This Trip Feeder has reversing and jogging features, to take care of all conditions incident to bringing in new trips. Full electrical protection is provided to prevent feeding while dump is in motion or dumping while trip is in motion.

There are many other quality engineering features built into the Nolan Rotary Car Dumpers and Trip Feeders—features that encourage better, safer, speedier coal delivery, at lower costs.





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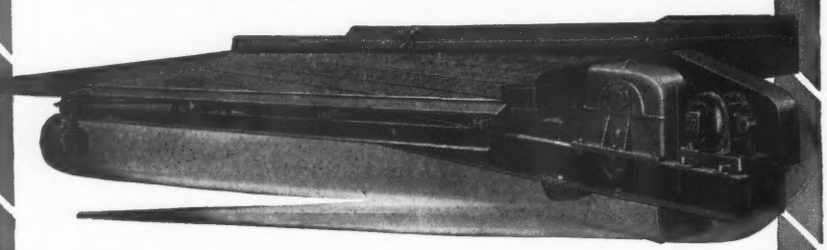
BOWERSTON, OHIO

One Man Operates a Large Battery of

SuperDuty

COAL TABLES

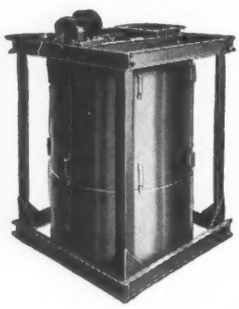


So simple and so complete are the washing operations with a SuperDuty Diagonal Deck Coal Table, that it takes but one man to handle dozens of tables — as many as he can see.

Such labor economy is significant, but more important is the unparalleled efficiency of the SuperDuty Table itself. The diagonal deck design places 75% more riffles in the natural path of the separative action, thus multiplying the efficiency of the operation.

VISIT BOOTH 809 — COAL SHOW

This action and many other SuperDuty features will be demonstrated in Booth 809 at the Coal Exposition in Cleveland, May 12-15. You are invited to come in and see for yourself why so many coal operators are demanding more and more of these diagonal deck tables that reduce costs while producing higher grade products.



CONCENCO FEED DISTRIBUTOR

The Concenco Revolving Feed Distributor is a heavily fabricated all steel machine, built in various types, with motor drive requiring less than ¾ H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table. *See it at the Coal Show.*

THE DEISTER ★
CONCENTRATOR
COMPANY
909 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

removed from the strip mine. At two mines, small stripping shovels also are used. Small diesel- or gasoline-powered shovels load the coal into trucks for transport to the tipple. Use of light earth-moving equipment in areas like these recovers coal that could not be mined economically in any other way.

Diesel Engines Underground, VI: Use of Diesel Locomotives in Construction of the Delaware Aqueduct: Effect of Exhaust Gases upon Quality of Tunnel Air, by L. B. Berger, M. A. Elliott, J. C. Holtz and H. H. Schrenk. U. S. Bureau of Mines, R.I. 4032. 26 pp. plus 3 pp. of illustrations; 8x10½-in.; paper, mimeo.; free. Continuation of a broad research program begun by the Bureau in 1937 on composition of diesel exhaust gases under various operating conditions, with studies of minimum acceptable ventilation underground where diesels are used. With proper maintenance of the fuel-injection and exhaust-and-intake systems, fuel of high quality, an exhaust-dilution system attached to the engine and adequate ventilation, diesel equipment may be used in tunneling without creating hazardous or objectionable conditions.

Explosives Accidents in Bituminous-Coal Mines, Coal-Mine Accident Prevention Course, Section 5. U. S. Bureau of Mines, Miner's Circular 58. 82 pp.; 5⅞x9⅛-in.; paper, mimeo.; 20c., Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. Useful suggestions for minimizing blasting hazards in coal mining, covering mine fires and gas and dust explosions. Illustrations, and a bibliography of other Bureau publications on explosives and other mine hazards.

Operation of the Illinois State Geological Survey, by M. M. Leighton. Circular 126, Illinois State Geological Survey, Urbana, Ill.; 1946. 50 pp.; 6¾x9⅞-in.; paper; price not quoted. A review of organization, equipment and scope of the geological survey. Special stress on mapping of coal beds, characteristics of coal beds, combustion of stoker coals and metallurgical coke. Also, oil and natural gas, industrial minerals, clay, lead, zinc, etc.

Low-Temperature Coke by the Krupp-Lurgi Process, by L. D. Schmidt. U. S. Bureau of Mines, I.C. 7395. 18 pp., plus 8 pp. of illustions; 8x10½-in.; paper; mimeo; free. The Krupp-Lurgi plant produces from a wide variety of coals or briquettes a low-temperature coke with 50 percent porosity, highly reactive, easily ignited and smokeless, with only 8 to 10 percent volatile matter. Germans used this coke for home heating, railroad fuel and water-gas generators producing synthetic gas for the Fischer-Tropsch plant.

The Labors of a Modern Hercules – COAL

COAL, MARVELOUS GIFT TO MANKIND,
PRODUCED THROUGH AEONS OF TIME BY THE UNBELIEVABLE ALCHEMY OF NATURE;
COAL, "THE STONES THAT BURNED LIKE WOOD COLES" IN THE FAR-OFF DAYS OF PERSIA AND GREECE;
COAL, WHICH BARELY WARMED ROMAN LEGIONS IN BRITAIN, AND FITFULLY FLAMED THROUGH DARK AGES OF ENGLISH HISTORY,
UNTIL HARDY HUMAN MOLES AT NEWCASTLE-ON-TYNE RECOVERED THE BURIED FUEL FOR HOME AND INDUSTRY.

COAL, EARTH-BOUND GIANT, RELEASED FROM ITS PRIMORDIAL PRISON BY **EXPLOSIVES**,
IS FOUND IN GREATER ABUNDANCE IN THE U.S. THAN ANY OTHER COUNTRY ON THE GLOBE,
HALF THE KNOWN WORLD RESERVES BEING LOCATED HERE.

COAL, WHERE FOUND IN VAST NEAR-SURFACE SEAMS, IS STRIP-MINED BY GARGANTUAN MONSTERS AND EXPLOSIVES.

THE EARLY MINER, PICKING HIS STINT OF **COAL**, WOULD MARVEL AT TODAY'S MASS PRODUCTION BROUGHT ABOUT BY MACHINERY AND **EXPLOSIVES**.

COAL

HAS RISEN FROM THE EARTH
TO MAKE IRON HIS SLAVE,
AND TOGETHER WITH ITS BY-PRODUCTS,
IS IN TRUTH A TERRESTRIAL MIRACLE.
THE RELEASE OF ITS PENT-UP POWER
THROUGH EXPLOSIVES
HAS BEEN A FACTOR IN ACHIEVING
INTERNATIONAL SUPREMACY
FOR THE U.S.A.

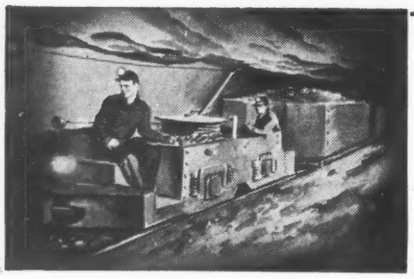
THE COMBINED TONNAGE OF UNDERGROUND AND OPEN-PIT MINING PRODUCES ENOUGH EACH YEAR TO BUILD A CHINESE WALL OF **COAL** AROUND THE U.S.

PIONEERS, WRESTING SLABS OF COAL FROM SURFACE OUT-CROPPINGS, WERE THE TINY BEGINNING OF TODAY'S GIGANTIC STRIP MINING.

HERCULES

EXPLOSIVES DEPARTMENT
HERCULES POWDER COMPANY
INCORPORATED
WILMINGTON 99, DELAWARE

XR-69



Equipment News

More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Manufacturer

Aluminum Jack

A new corrosion-resistant aluminum body is being offered by the Duff-Norton Mfg. Co., P. O. Box 1889, Pittsburgh 30, as optional equipment with its mine-roof jacks. Substitution of aluminum tubing for 2-in. black pipe in standard Duff-Norton 8- and 16-ton mine-roof jacks provides a weight reduction of more than 2½ lb. per jack foot, an over-all weight saving of almost 40 percent on a 6-ft. jack, according to the manufacturer. The new aluminum body is said to be especially advantageous in mine timbering work where jacks must be handled and reset frequently. Safe, positive-acting Duff-Norton mine-roof-jack bases and top fittings also are furnished with the new aluminum body in any desired jack height.

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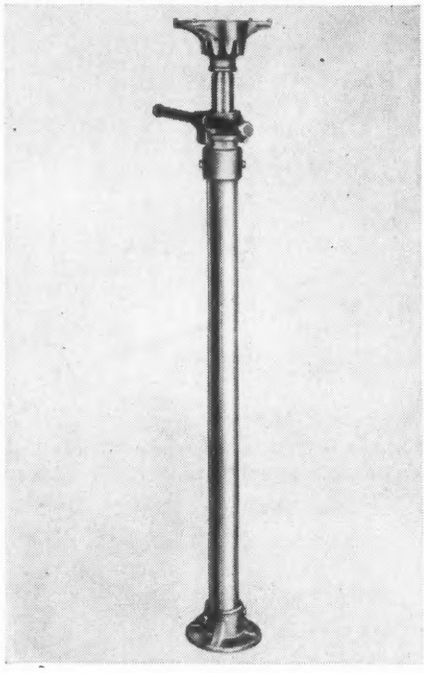
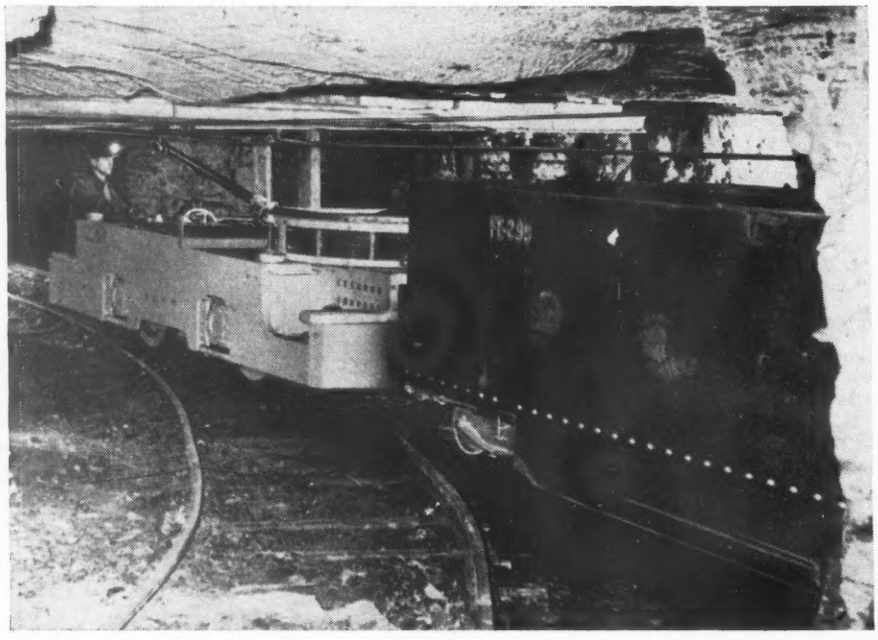
Mine Locomotive

The new Westinghouse Dual-Duty mine locomotive, designed for efficient handling of both gathering and swing operations, has gone into operation at a large West Virginia coal mine, according to the Westinghouse Electric Corp.

Nominally rated at 8-tons, this Dual-Duty locomotive has two speed ranges—from a creep speed to rated 5 m.p.h. when operating on the reel for gathering, and up to a rated 7½ m.p.h. when on the trolley for hauling to a main siding. The two-speed feature is obtained by operating the motors on full field only when on the reel and on full field, or shunted field at higher speeds, when on the trolley pole. Operation is simplified by a parallel-reversing single-handle controller, according to the manufacturer.

Service brakes are hydraulically operated and an accumulator makes possible three or four full brake applications after power is shut off. Parking brakes are screw-operated and can be used as service brakes. When the motor controller must be reversed to help bring the locomotive to a stop, a current-limiting feature protects the motor from excessive currents. The unit now in service is an explosion-tested locomotive.





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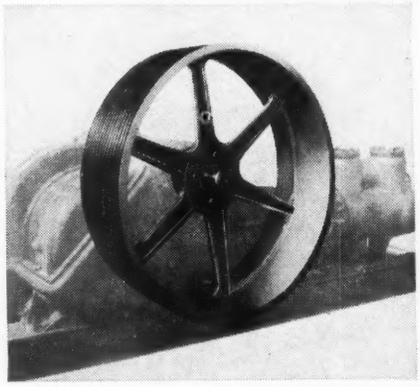
Sheaves

Two new lines of QD sheaves featuring improved groove-belt fit and reinforced arm construction, have been announced by Worthington Pump & Machinery Corp., Harrison, N. J. Designated as the A and B lines, each will feature individual groove size to match belt size—an A groove for an A belt, and a B groove for B belt—and former A-B combinations have been discontinued.



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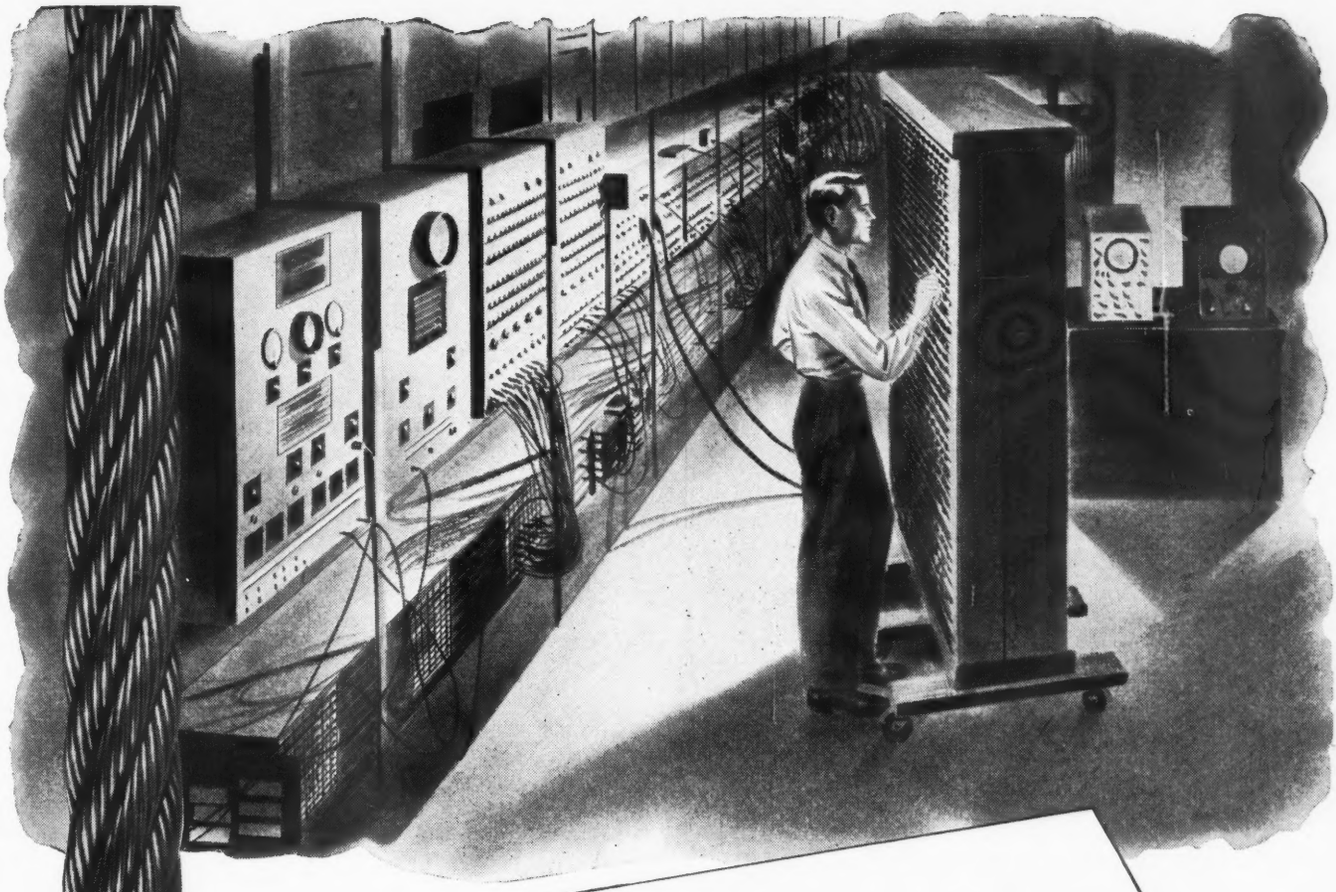
Percussion Bits

A percussion bit for pneumatic drilling in hard rock has been added to its line, according to an announcement by Kennametal, Inc., Latrobe, Pa. The bit has a chisel-type design and a hard wear-resistant Kennametal cutting edge.

The bit has been tested on many rough-drilling jobs in many parts of the country, with effective results, the manufacturer reports. For example, 50 ft. of 1⅜-in. holes was drilled in solid granite with one of the bits before it was removed from the driving rod because of wear, the company says. The hole sizes at the end of the drilling were approximately the same and, after resharpening, the bit was good for more footage. The



Precisionbilt LIKE AN ENIAC*

J&L WIRE ROPE

PERMASET PREFORMED

Like an ENIAC,* J&L Wire Rope is Precisionbilt to save you time and money. J&L rope is made of J&L Controlled Quality Steel to last longer and reduce the down time of your equipment. It is a wise economy to standardize on J&L Precisionbilt Wire Rope for all uses. Specify it on your next order.

**The ENIAC (Electronic Numerical Integrator and Computer) is a phenomenal "thinking" machine that does in seconds scientific and engineering calculations which would require weeks—even years—if done with pencil and paper by trained computers.*

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

Operating Men Say...

The NEW MORRIS Type "R" SLURRY PUMP

DOES MORE
LASTS LONGER
CUTS OPERATING COSTS
EASY TO INSTALL & MAINTAIN

Whether you use a Morris Type "R" Slurry Pump for new installations or for replacement, it pays off with service you cannot get in any other pump in the market. *Because*—

New Morris Type "R" Slurry Pump Has These Outstanding Features

1. The gland is under suction pressure only
2. In dismantling, you remove only four bolts
3. Impeller and liner are removable without disturbing piping
4. Shell is interchangeable for right or left hand rotation

These four features alone are enough to convince an operating man . . . but if you're looking for more features . . .

WRITE TODAY FOR Free BULLETIN!

Valuable information in this Bulletin shows by simple performance curves just how the New Morris Type "R" Slurry Pump fits into a specific operation . . . Gives exclusive construction features of the Pump.

MORRIS MACHINE WORKS
Baldwinsville, New York

The New Morris Type "R" Slurry Pump handles all types of mixtures containing abrasive solids . . . ore concentrates . . . tailings, slag and residue from filters and classifiers.

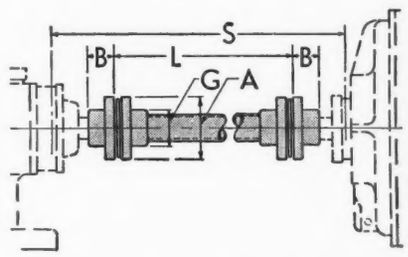
MORRIS *Centrifugal Pumps*

granite was drilled at the rate of 1 ft. per minute, and other experience in drilling quartz, silica sand, limestone and other hard substances is cited by the manufacturer. The bits are economical to use, it is said, since less compressed air is required, operation between bit changes is longer and drilling speeds can be more than doubled. They are presently being manufactured in 1⅜-in. and 1⅝-in. sizes.

•

Flexible Couplings

Thomas Flexible Coupling Co., Warren, Pa., has announced two new additions to its line. The ST coupling is a single type for angular misalignment and was designed principally for use with outboard bearings or their equivalent. The coupling is self-aligning, self-supporting, maintains exact inter-relationship of the connecting shafts and is so designed that it will support the armature or



rotor of motors and generators, thus eliminating one bearing, according to the company. A safety feature provided will prevent the dropping of the armature or rotor in case of an accident from overstress. Savings resulting from its use include shorter bed plate, less floor space and cost of one bearing, it is said.

The SN-Type coupling consists of two single couplings connected with an intermediate shaft and is designed primarily for high-speed drives between motors and gear reducers located some distance apart. The coupling is so constructed that pilot bearings are not needed to keep the floating shaft concentric and in balance, the company says. Since these couplings usually operate in the presence of corrosive fumes and moisture, they can be furnished of steel with zinc-plating or of all stainless steel.

•

Spotlight

The new Wheat rechargeable spotlight has been announced by the Koehler Mfg. Co., Inc., Marlboro, Mass. With a 2-cell 4-volt lead-acid-type battery, the lamp is said to burn six hours with a high-power bulb and 12 hours with a lower-candle-power bulb. The lamp offers a positive "non-spill" construction and it is not necessary to take the lamp apart to charge it or add water, according to the company. All parts of the lamp, which weighs a total of 95 oz., are high-lustre chrome finish. There is

It lends a helping hand to RIGGING UP

...Save installation time with limber, kink-resistant *PREFORMED* YELLOW STRAND

You've finished checking block, sheaves and drum. Now you're about to put on a new *Preformed* Yellow Strand line. Watch how its flexibility simplifies each stage of installation.

Note the willing way it comes off the reel or coil. Here's where unpreformed rope too often meets with injury. But there's no twisting, no kinking, with *Preformed* Yellow Strand—and that goes also for Lang lay and Independent Wire Rope Center constructions. Pent-up stresses have been *relaxed* by preshaping wires and strands during manufacture.

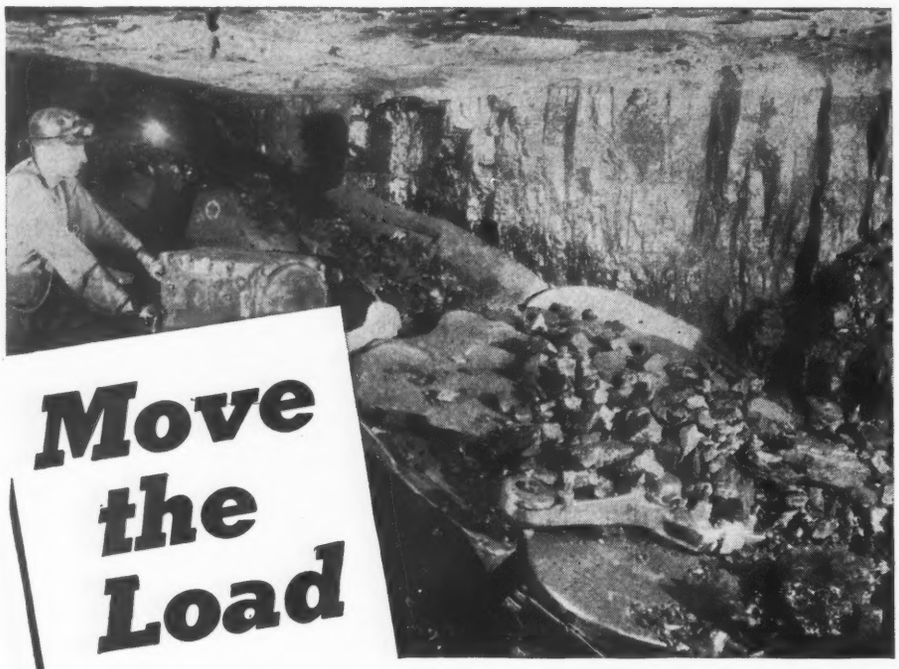
Since the ends do not flare out, limber *Preformed* Yellow Strand can be threaded quickly through blocks and sheaves... attached easily to the drum ... socketed or fastened without distorting the parts. Smooth, even first-time spooling further shortens changeover delay.

Crowning all these time-saving advantages is the *longer life* of *preformed* rope which postpones replacements, keeps men and machines on productive jobs.

Specify *Preformed* Yellow Strand by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* New York, Chicago, Houston, Portland, Seattle. *Factories:* St. Louis, Seattle, Peoria.

HAND BOOK FREE: "Wire Rope for Mining" contains useful facts, tables, pictures. Write for your copy.

BRODERICK & BASCOM
Yellow Strand
PREFORMED WIRE ROPE



Move the Load

OFF CABLE MAINTENANCE

When costly equipment shutdowns plague production because power supply cables don't measure up to the job—switch to Deltabeston,* and take a load off your repair crews.

Deltabeston apparatus and motor lead cables help you fight production tie-ups. They're designed and built to keep mine equipment hard at work in spite of overheating and rough use.

Tough Deltabeston cables are protected against heat with two layers of felted asbestos insulation. A varnished fabric layer resists moisture. A sturdy, asbestos braid covering takes abrasion and rough handling in its stride. And it's a natural for protection against the ravages of greases and oils.

For fewer shutdowns on the job, remember Deltabeston. It's made to help you keep production up, maintenance down. Write for data or engineering assistance. Section Y65-414, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut. **Trade-mark Reg. U. S. Pat. Off.*

LOOK FOR US IN CLEVELAND

We'll be on hand at the Coal Exposition to explain Deltabeston to you. Bring your wiring problems along, or just drop in for a talk. We'll be there throughout the show, May 12-15.

Deltabeston WIRES and CABLES

GENERAL ELECTRIC

a protective lens guard and an all-leather carrying strap allows free use of both hands.

•

Crusher

A stoker-coal crusher that enables dealers and others to supply customers with stoker coal has been announced by the Eagle Iron Works, Des Moines, Iowa. The Eagle crusher reduces egg and nut coal down to stoker size at the rate of 18 to 25 tons per hour and requires only 5 hp. to operate, according to the manufacturer. Normal size of coal produced is ¾-in. but the long-wearing alloy semi-steel rollers are adjustable to bring size down to nearly ⅜-in.

The rolls, 12 in. in diameter by 16 in., operate normally at 250 r.p.m. and one set of bearings is backed with a release spring to permit passage of any hard foreign material without damage to crusher. The hopper has a 17 x 24-in. opening for easy loading and baffle plates to distribute feed evenly to the rolls. Drive may be either V or flat belt.

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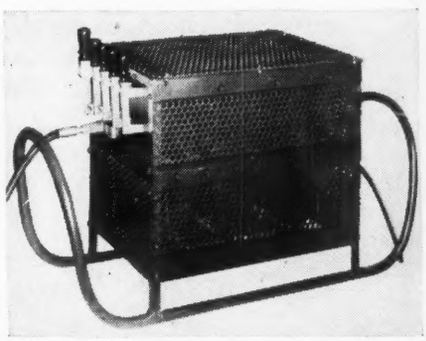
Welder

A new welding machine available in 250- and 500-volt sizes, said to be compact and light enough to be conveniently carried through a mine by one man, has been announced by the



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AL AGE

You are invited to see

EUCLID COAL HAULERS

and other Hauling Equipment

for Overburden and Gob

EUCLID

THE PIONEER

at the Coal Exposition May 12-15

You'll want to see the 40-ton Bottom-Dump Euclid Coal Hauler and Rear-Dump models for overburden and gob hauling on display at the Coal Show. And while you are in Cleveland we hope that you'll give us an opportunity to show you the modern new factory where Euclid equipment is built. Just drop in at our exhibit and we'll arrange a plant trip at your convenience.

We are looking forward to seeing you in Cleveland and hope you'll put Euclid Headquarters on your "must" list for the Coal Exposition.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

"NO WONDER I'M HAPPY

and I feel a lot safer now. My boss has just insured us in the **COAL OPERATORS CASUALTY COMPANY.** Their record for safety work in coal mines has been tops for years. No company can do better than place its Workmen's Compensation and Public Liability with them."

COAL OPERATORS CASUALTY COMPANY

GREENSBURG, PENNSYLVANIA

DEPENDABLE PERFORMANCE *Always*

Standard and Special Mine Track Work

For more than sixty years Weir Kilby has been manufacturing good quality trackwork for Railways, Mines, and Industrial plants. As rolling stock and other apparatus have become heavier we have improved and strengthened our product to meet these new service demands. Our many customers are pleased with our good deliveries, reasonable prices and superior product. We will be glad to work with you. Many items, such as TITAN Frogs, Switches, Switch Stands, etc., can be shipped from stock. Others will be made up promptly.

CATALOG "H" comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.

Suppliers to Mines and Railroads Since 1882

WEIR KILBY CORPORATION

CINCINNATI 12, O. BIRMINGHAM 7, ALA.

Flood City Brass & Electric Co., Johnstown, Pa. The unit weighs approximately 40 lb. in the 250-volt size and approximately 70-lb. in the 500-volt size. The machine is guaranteed to be efficient for bonding and various repair work around a mine, according to the manufacturer.

•

Electrodes

A complete line of stainless-steel electrodes in a full range of grades and diameters has been announced by Air Reduction Sales Co., 60 East 42nd St., New York 17.

All Airco stainless-steel electrodes are furnished with a heavy extruded lime-type coating for d.c. application, and in addition all but the straight chrome analyses are obtainable with a lime-titania-type coating usable on a.c. or d.c., according to the manufacturer. The slag produced by either of these coatings is easily removed.

Electrodes with the lime-titania-type coating (a.c.-d.c.) offer many desirable features not found in the lime-type-coated electrodes, for example, satisfactory usability on a.c. that eliminates arc blow and results in easier manipulation, more uniform arc action and better appearance of deposit, according to the manufacturer. They can be recommended for all applications on which the lime-type electrode is used, with the possible exception of highly restrained joints on heavy sections or on steels of high hardenability.

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Railroad Car Tool

Industrial Products Co., 2768 North Fourth St., Philadelphia 33, has introduced a speed-up safety tool for closing and locking latch-type drop-bottom railroad cars. According to the manufacturer, the tool is easy to use, cuts the time consumed and is safer than many types of bars and levers.

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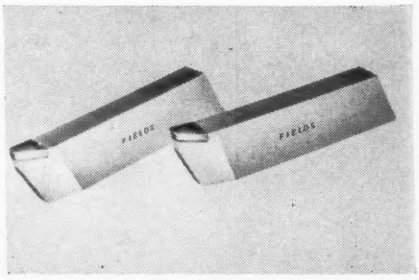
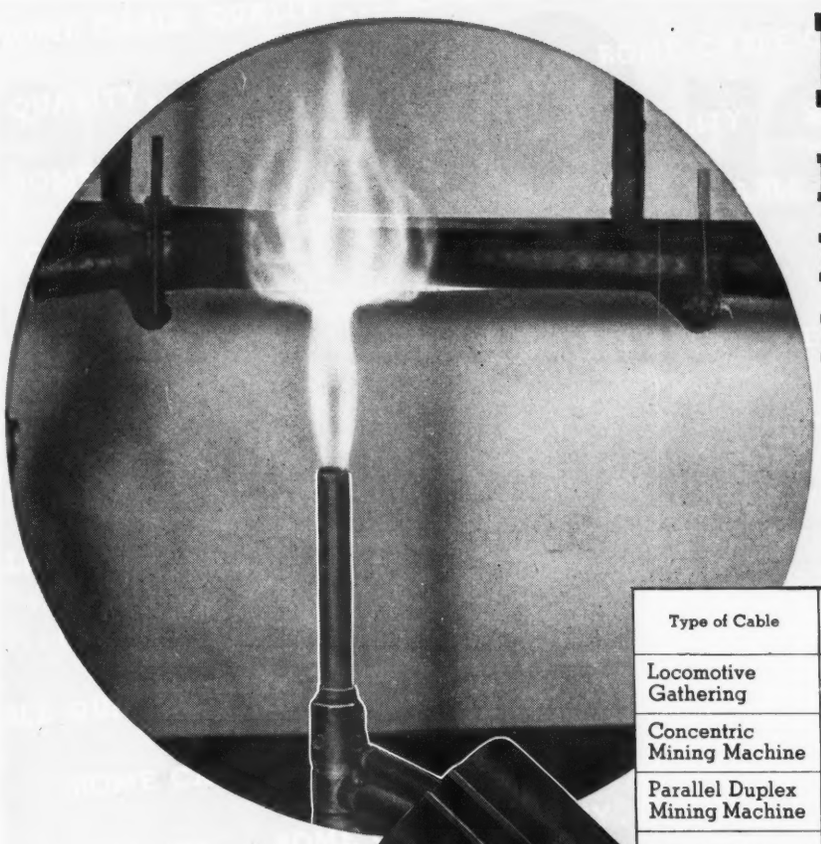
Carbide Bits

The Fields Mfg. Co., Morgantown, W. Va., has increased its range of mining supplies by adding a new line of Fields carbide-tipped coal-cutting bits.

Designed specifically for the coal mining industry, Fields cutter-chain bits have the ability to resist abnormal wear, withstand extreme shock and remain sharp over long periods of operation, the company states.



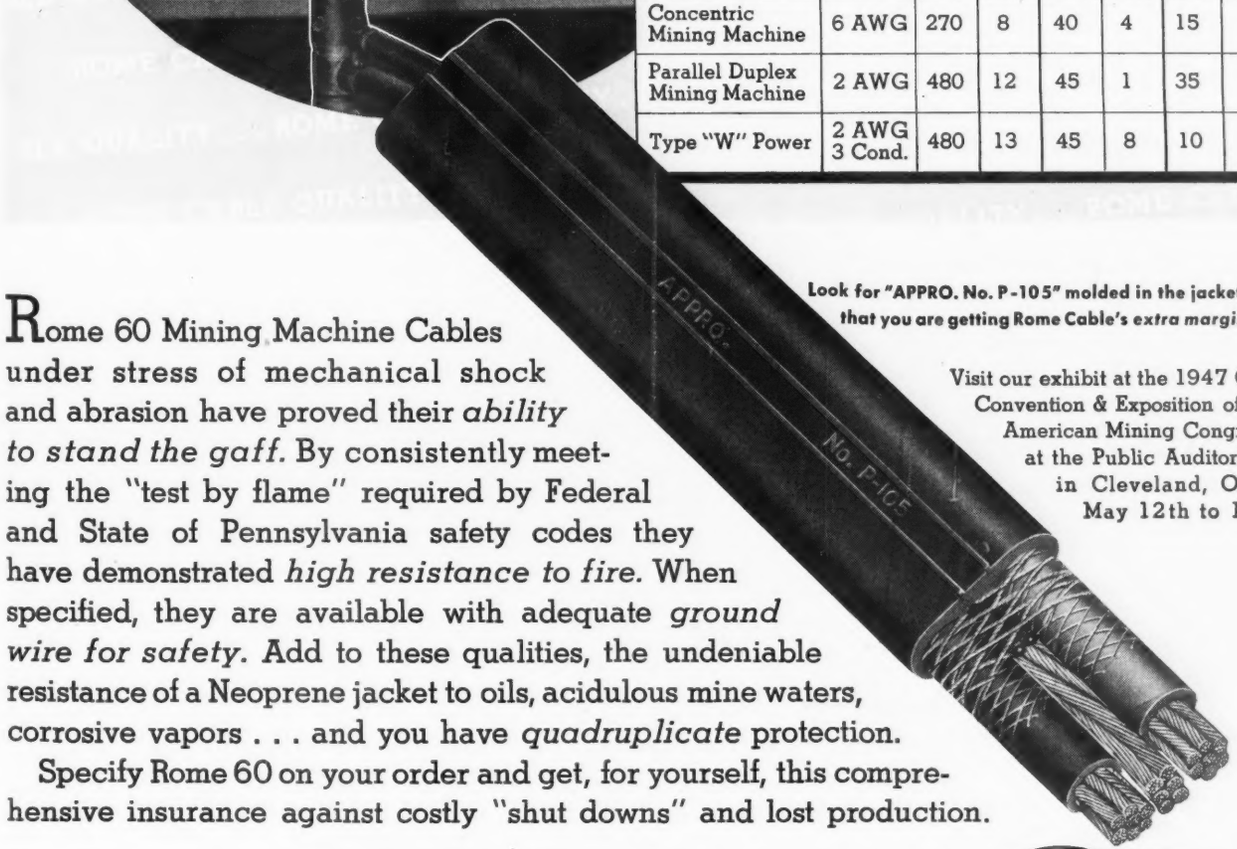


Rome 60
MEETS FLAME TEST REQUIREMENTS BY WIDE MARGIN

SUBSTANTIATED BY NOTARIZED TEST ON EVERY PRODUCTION RUN

The following is taken from a typical attested and notarized flame test report as filed for *each* production run. Note the recorded flame propagation. Federal and State of Pennsylvania safety codes permit up to 14".

Type of Cable	Size	Amps. Load'g	Heating Time		Burning Time		Propagation
			Min.	Sec.	Min.	Sec.	
Locomotive Gathering	2 AWG	480	12	50	3		5"
Concentric Mining Machine	6 AWG	270	8	40	4	15	7¼"
Parallel Duplex Mining Machine	2 AWG	480	12	45	1	35	6"
Type "W" Power	2 AWG 3 Cond.	480	13	45	8	10	7¾"



Look for "APPRO. No. P-105" molded in the jacket to be sure that you are getting Rome Cable's *extra margin of safety.*

Rome 60 Mining Machine Cables under stress of mechanical shock and abrasion have proved their *ability to stand the gaff.* By consistently meeting the "test by flame" required by Federal and State of Pennsylvania safety codes they have demonstrated *high resistance to fire.* When specified, they are available with adequate *ground wire for safety.* Add to these qualities, the undeniable resistance of a Neoprene jacket to oils, acidulous mine waters, corrosive vapors . . . and you have *quadruplicate* protection.

Specify Rome 60 on your order and get, for yourself, this comprehensive insurance against costly "shut downs" and lost production.

Visit our exhibit at the 1947 Coal Convention & Exposition of the American Mining Congress, at the Public Auditorium, in Cleveland, Ohio, May 12th to 15th

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION
ROME • NEW YORK

Barber-Greene

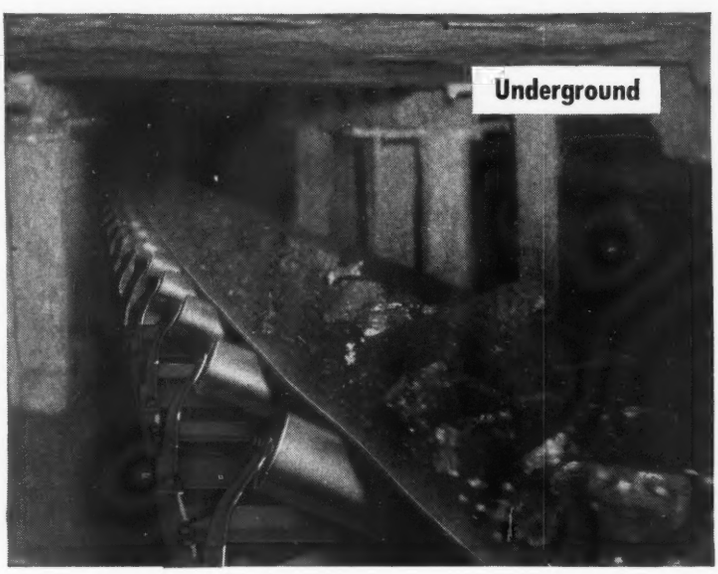
Pre-engineered—to bring your costs down!

As any mine operator knows, there are many problems involved in getting coal from the face to the tipple. And as so *many* know, Barber-Greene can answer many of them—with pre-engineered Belt Conveyors that are installed with minimum assembly work or on-the-job fabrication.

For instance: Where headroom is at a premium, Barber-Greene has the answer in simple channel-frame conveyors that are standard in the B-G line. And this line includes the right accessories to enable you to get the complete conveyor system from a single source.

You, too, should know how your conveying jobs can be handled best by standardized Barber-Greene Belt Conveyors. See your Barber-Greene distributor.

Aboveground



Underground

Barber-Greene Belt Carriers can make your belt conveying systems more trouble-free, less costly to operate. All-welded; plain, roller or ball bearings as your job requires.

65

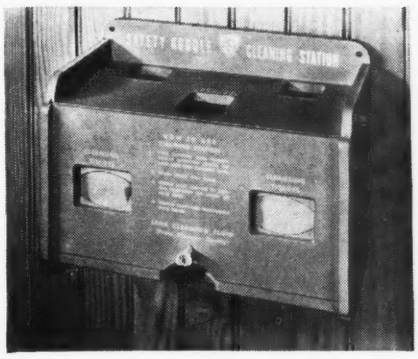
BARBER-GREENE COMPANY • AURORA, ILLINOIS

Constant Flow Equipment

BUCKET LOADERS • BELT CONVEYORS • PORTABLE BELT AND FLIGHT CONVEYORS • CAR UNLOADERS • SNOW LOADERS • COAL LOADERS

Goggle-Cleaning Station

A new safety-goggle cleaning station that can be attached to the wall at strategic locations throughout plants has been announced by the American Optical Co., Southbridge, Mass. Made from selected hardwood,



in safety green color, with smoothly lacquered finish, the cleaning station is designed in a small, compact unit, with provision for all necessary cleansing and anti-fog materials, which also may be obtained from the company. It is 13 in. long, 9 in. high and 6 in. deep. Directions for using the goggle cleaning station are printed on the front panel of the cabinet.

•

Industrial Notes

Four Wheel Drive Auto Co., Clintonville, Wis., has announced consolidation of its sales promotion and advertising departments and the appointment of M. O. Stockland Jr., formerly sales promotion manager, as manager of the new department.

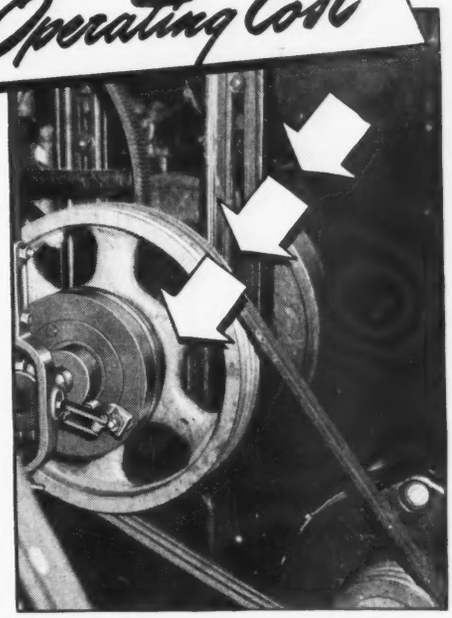
Gar Wood Industries, Inc., has named E. B. Hill, with Gar Wood since 1925 and formerly district manager of the general line with headquarters in Chicago, director of factory sales.

Ohio Brass Co., Mansfield, Ohio, has appointed Richard W. Parsons technical director of its Mansfield factory. Mr. Parsons has been in the engineering department of Ohio Brass for 20 years and became chief metallurgical engineer in 1942.

Allis-Chalmers Mfg. Co., Milwaukee, has transferred R. W. Dugan, engineer's assistant in the crushing, cement and mining section of its basic industries department, to the company's district office.

International Harvester Co., Chicago, has announced the following changes in branch management: A. C. Lanham, formerly retail sales manager at Indianapolis, Ind., motor truck branch, has been appointed assistant branch manager at Salt Lake City. F. R. Kemple succeeds Mr. Lanham as Indianapolis retail man-

KINNEY CLUTCHES
for Reduced Operating Cost



Individual motor drive with Kinney Interchange Clutches helps busy machines operate at top efficiency. The clutch, when disengaged, allows the motor to come up to speed without load and permits the use of a small, economical motor just large enough to run the equipment. The Kinney Clutch engages smoothly, with ample slippage to absorb a heavy starting load and the rugged toggle mechanism locks the friction plates together when fully engaged. All power is transmitted through flat discs and *not* through bolts or shifting mechanism. Kinney Interchange Clutches are available in solid or split construction for easy installation, with capacities 2 to 40 H.P. per 100 r.p.m.

Write for Bulletin K-8

KINNEY MANUFACTURING CO.
3525 Washington St., Boston 30, Mass.
New York • Chicago • Philadelphia
Los Angeles • San Francisco
We also manufacture Vacuum Pumps, Liquid Pumps and Bituminous Distributors

FLEXIPIPE
The improved flexible tubing for mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by more rigid means of face ventilation.

Write for free sample and full information

BEMIS BRO. BAG CO.
412 Poplar Street, St. Louis 2, Mo.

MORE HAULAGE FOR 20% LESS BATTERY CAPACITY

Double knee-action; better trackability. Floating power; less power consumption. Quick acting footbrake — essential for quick stopping, especially behind loading machines. Brake shoes that follow wheels (due to knee-action). Adjustable Timken Bearings throughout.

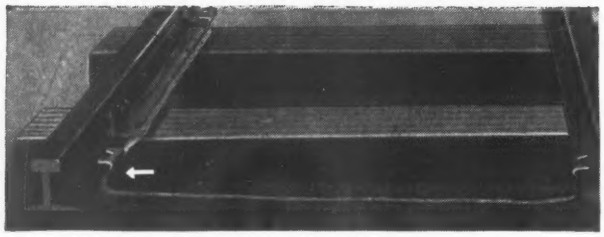
Huskiest transmission in any storage battery locomotive. Oil-tight; leakproof. Use regular auto oil; change every 6 months. Strong. Simple design. Low maintenance cost. Backed by over 25 years of experience with Storage Battery locomotives.

GREENSBURG "MONITOR"

Franklin County Coal Corporation at Royalton and Herrin, Illinois, have 12 of our Monitor type, storage battery locomotives.

All Greensburg Locomotives are CUSTOM-BUILT to your requirements

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.



featured at BOOTH *1404 CLEVELAND COAL SHOW

THE MESCOWELD TYPE M8X-F

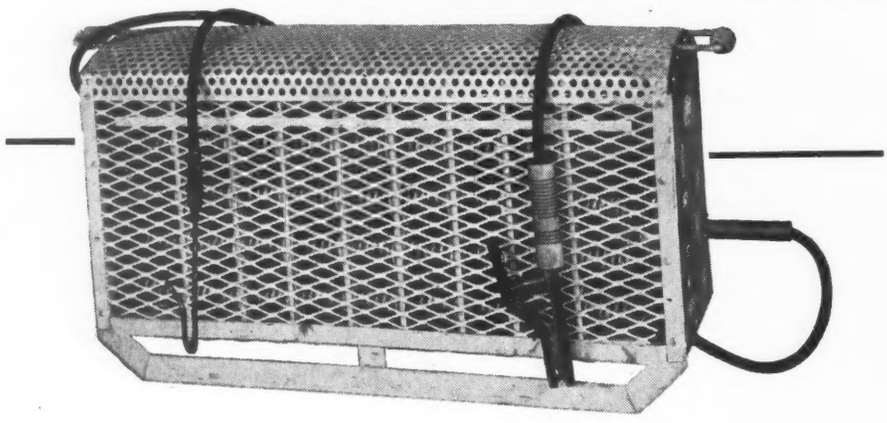
Combination Joint And Cross Bond

★By combining joint and cross bond as a single unit the M8x-F reduces welding operations to three instead of four mine welds. The illustration shows how this is accomplished. Terminals are designed for ease of welding, further reducing welding time.

See the M8x-F at our Booth No. 1404 when you visit the Cleveland Coal Show. More than a dozen types of MESCOWELD Rail Bonds will be exhibited, together with various types of switches and other Mosebach electrical supplies for the coal mining industry. Our representative there will gladly give you complete details about any of these products.

Mosebach Electrical Supplies for all Coal Mining Operations

MOSEBACH ELECTRIC & SUPPLY CO.
1115 Arlington Ave. Pittsburgh 3, Pa.
PHONE HEmlock 8332



easy to move . . . easy to use

The G.M.C. Portable Arc Welder can be brought to the job, hooked up, used and moved out easily and quickly. Handles are located conveniently AWAY from the unit to cool off. Coils are protected from all sides and the unit is sturdily constructed to take hard use. If you are looking for a practical PORTABLE Arc Welder this is the answer!

G.M.C. Portable ARC WELDER

for 250 or 500 Volt D. C.

GUYAN MACHINERY CO. LOGAN WEST VA.

ager. L. W. Madery, formerly sales promotion manager at Saginaw, Mich., has been appointed assistant manager, Indianapolis, motor truck branch. J. W. Cooper, formerly manager of International's Harrisburg general line branch, has been appointed manager of the company's new parts depot at Baltimore, which will open in July. This parts depot, one of several to be opened, will serve 33 branches and more than 1,000 dealers in nine eastern seaboard states.

Bemis Bro. Bag Co., St. Louis, has elected R. D. McAusland, Seattle, a vice president of the company. Mr. McAusland started his career with Bemis in 1900, becoming manager of the Seattle plant in 1913. Since 1936, he has been a director of the organization and was appointed Pacific Coast general manager in 1941. He will continue his headquarters at Seattle.

West Virginia Steel & Mfg. Co., Huntington, W. Va., has named J. B. Haskell, formerly manager of sales, rail and track division, to the position of manager, market research and engineering development. Mr. Haskell, who has been prominent in industrial track work for many years, has been with the company for 24 years. W. F. Robinson, salesman for the West Virginia territory, succeeds Mr. Haskell as manager of sales, rail and track division. Billy N. Owens, who served as an Army Air Forces pilot and who was with the company before the war, will be manager of warehouse sales at a warehouse to be opened at the local plant soon.

Sanford-Day Iron Works, Knoxville, Tenn., has elected as president Parry S. McCallen, former vice president who has been with the firm for 26 years, succeeding J. F. Baker, who has become chairman of the board of directors. George E. Jones has been named vice president, succeeding Mr. McCallen. Hugh W. Sanford Jr. has been elected first vice president, Alfred Sanford, secretary, and Fred J. Moses Sr., treasurer.

Cantol Wax Co., Bloomington, Ind., has appointed Surpless, Dunn & Co., New York and Chicago, as the selling organization for Cantol belt wax, to handle distribution throughout the 48 states and many foreign countries.

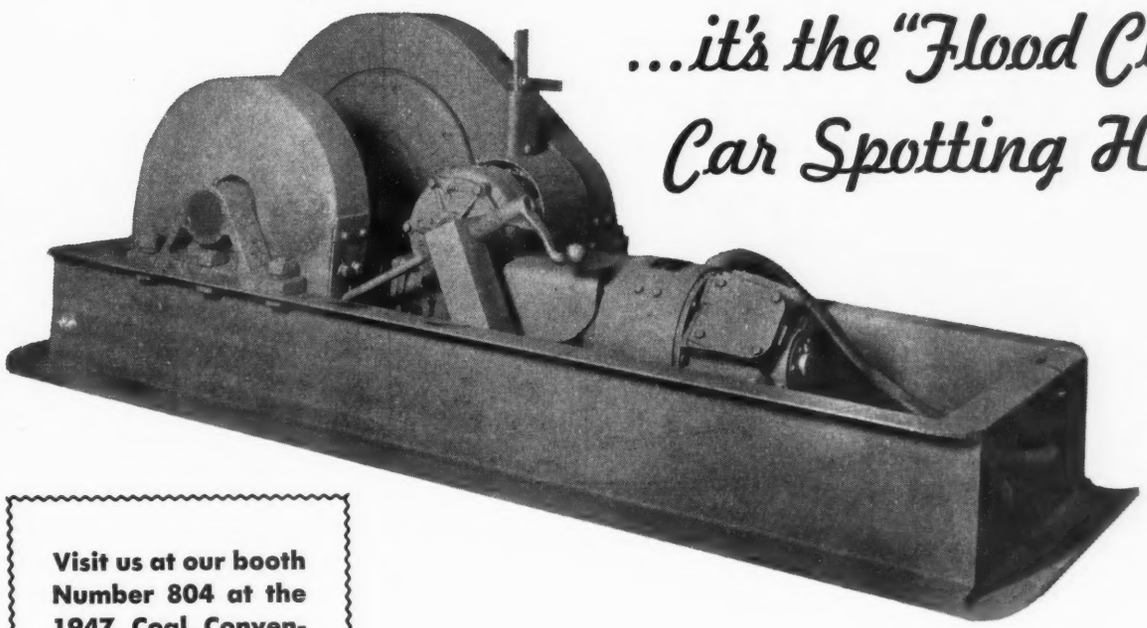
Westinghouse Electric Corp. has announced plans to expand manufacturing facilities at its Buffalo, N. Y., plant. The new operation, formerly a part of the switchgear and control division at East Pittsburgh, will eventually include motor, industrial control, copper wire and welding activities, and will be known as the Buffalo Divisions. L. R. Ludwig, manager of the motor division, will be manager of the new operation. The new setup, together with formation of the "Standard Control

HERE'S A WAY TO BOOST OPERATIONS

A quiet operating, self oiling worm gear reducer is featured in this hoist which is rated at 6000# rope pull at 35 feet per minute. This drive is inherently non-reversible holding the drum stationary when motor is stopped and permitting the use of any standard make or type of motor. A sturdy jaw clutch frees the drum for coupling the trip.

General specifications of the Flood City Car Spotting Hoist: Length, 7' — Width 29½" — Height 30½" — Weight 2,195 Lbs. — Rope Capacity, 500 feet ⅝ inch, 750 feet ½ inch — frame of channel iron with solid steel bottom — completely guarded — all parts readily accessible.

Write for information on Flood City Hoists and mining equipment. Complete catalog information on request.



...it's the "Flood City" Car Spotting Hoist

Visit us at our booth Number 804 at the 1947 Coal Convention in Cleveland.

Flood City

Brass & Electric Co., Johnstown, Pa.

PROMET
THE Engineered BRONZE

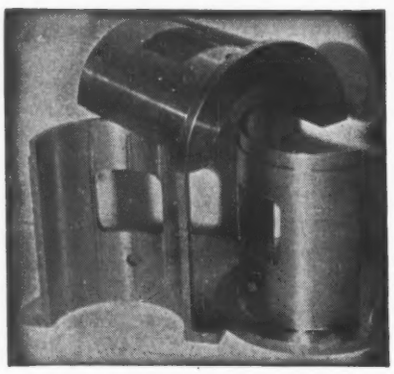
TO ASSURE LONGER BEARING SERVICE . . . LOW UPKEEP

AXLE BEARINGS
JOURNAL LINERS
BUSHINGS and
WEARING PARTS

For

GENERAL ELECTRIC • GOODMAN
WESTINGHOUSE • SULLIVAN
OLDROYD • JOY • JEFFREY
EQUIPMENT

A SPECIFIC FORMULA FOR EACH APPLICATION



PROMET CASTINGS

Any size, shape or section, up to 3,000 lbs. Pattern making, designing, machining.

★

BAR STOCK

round, hexagon, square. Rough cast, semi-finished. Cored stock all sizes (by ⅛" steps) from ½" minimum core to 12" O.D. and 12" lengths. 6 grades of hardness.

★

PROMET MINE SPECIAL BABBITT

Lead base, all virgin metals, perfectly alloyed. Fine, velvety grain. Entire bearing surface wears uniformly, without pitting. Unaffected by moisture. Simply heat to 900°-950° and pour.

Can be repeatedly remelted and reworked. Repouring only refines it. No appreciable shrinkage, hence better contact with supporting shell, a more solid, rigid bearing. Supplied in 10 lb. pigs.

★

Write for free folders.

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1307 Oberlin Ave., Lorain, Ohio, U. S. A.

Prompt deliveries can usually be made from stocks maintained at

BECKLEY, W. VA., The Universal Supply Co., 1207 S. Kanawha St.	Phone 3642
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BIRMINGHAM 1, ALA., O. D. Lindstrom Equipment Co.	Box 103
DENVER, COLO., Urquhart Service, 16th St. at Blake	Phone Main 0331
MT. LEBANON, PA., J. E. Nieser, 720 Roselawn Ave.	Phone LE 9876
WHEELING, W. VA., Pollish & Company, 110-111 Fidelity Building	Phone 1795
WILLIAMSON, W. VA., Williamson Supply Co.	Phone 1200

Division," which plans to operate in a new plant at Beaver, Pa., will mean more space available for the transportation and generator, switchgear, and feeder divisions in East Pittsburgh and the company hopes that this arrangement will enable these divisions to increase their capacities by from 30 to 40 percent.

DeLaval Steam Turbine Co., Trenton, N. J., has appointed Hans Gartmann, associated with DeLaval since 1924, chief engineer of its centrifugal pump and compressor department. Harold V. Rasmussen has been named chief engineer of DeLaval's turbine department. Before coming to DeLaval in 1941, Mr. Rasmussen was connected with the Westinghouse Electric Corp. for 19 years. Harry Engvall has recently been appointed chief engineer of the helical gear department of the DeLaval company, with whom he has been associated for 23 years.

Westinghouse Electric Corp. has appointed C. B. Stainback as industrial syndicate manager, a new position created to better coordinate the industrial sales activities of the company. Mr. Stainback, who was manager of the industrial sales department and who has been with Westinghouse since 1910, has been succeeded by John E. Payne, formerly manager of industrial sales for the central district.

Jenkins Bros. has elected to its board of directors C. C. Chamberlain, general sales manager, and James L. Dunn, vice president in charge of industrial relations. Mr. Chamberlain joined the company in 1929 and Mr. Dunn in 1913.

Davey Compressor Co., Kent, Ohio, has appointed Floyd Jones, formerly northeastern district manager, sales manager of its portable compressor division.

Raybestos-Manhattan, Inc., Passaic, N. J., has appointed George W. Marshall Jr. general sales manager, Asbestos Products Division. In his new position, Mr. Marshall will continue as general manager of the Asbestos Textile & Packing Division and in addition will direct the sales activities of the corporation's Equipment Sales Division.

Beckwith Machinery Co., Pittsburgh, has appointed George A. Scott as salesman for its Wilkes-Barre office to represent the company in Clinton, Lycoming, Sullivan, Montour, Columbia, Northumberland and the lower section of Luzerne County.

Lima Locomotive Works, Inc., Lima, Ohio, was recently awarded a certificate of merit by the Industrial Commission of Ohio, Division of Safety and Hygiene, for having the best safety record of the heavy industries division for 1946. The

FOR BETTER MOTOR BRUSHES
★ Call OHIO
FOR Specially Designed MOTOR BRUSHES
★ Call OHIO
FOR INFORMATIVE CATALOGS and MOTOR LISTINGS
★ Call OHIO
FOR THE ANSWER TO YOUR MOTOR BRUSH PROBLEMS
★ Call OHIO

THE OHIO CARBON COMPANY
12508 BEREA ROAD
CLEVELAND 11, OHIO

It Sure Fits in a Pit!

When the Oliver "Cletrac" dealer told me that a Cletrac crawler tractor with a Drott Bull Clam could really help us step up our production, I was a bit skeptical. But just look at that unit! Why it does just about everything . . . but *good!*

Right now, we're using it to strip off overburden. The way you can tilt the blade and apply down pressure while the tractor is in motion, permits you to clean off practically all the dirt without spillage. You don't waste a lot of time and effort cleaning up spilled overburden after stripping.

And it's a dandy at cleaning up loose coal behind the loading shovel. It carries coal ahead of the shovel for loading into haulage equipment. It saves us tons every day and really speeds shovel operation since the shovel operator doesn't have to make as many clean-up passes.

That's not all. We use the unit to reclaim spilled coal at loading points in both pit and tipple. It's a big help in road building and maintenance work . . . in building, maintaining and repairing levees and dams . . . in stock piling coal and screenings and a lot of other tasks.

Yes, sir, that Oliver "Cletrac" dealer sure knew what he was talking about. He's a big help!

Cletrac

a product of

The OLIVER Corporation

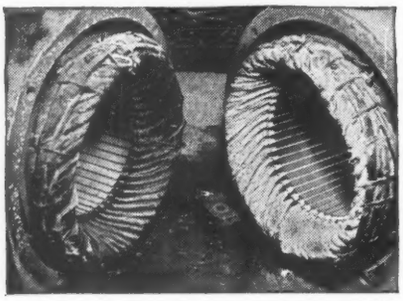
Industrial Division, 19300 Euclid Avenue, Cleveland17, Ohio

Silicone News

DC SILICONES

It's NEWS when a Silicone insulated motor fails

EVEN UNDER MOTOR KILLING TEST CONDITIONS



Class B Insulated Motor failed after 3760 hours at 200°C. | *Silicone Insulated Motor failed after 5178 hours at 300°C.*

In spite of operation for a longer time at a temperature 100°C. above the operating temperature of the Class B motor, both windings look about alike and show about the same degree of deterioration.

For three years we have subjected Silicone insulated motors to accelerated life testing in our Motor Test Laboratory—trying to make them fail so that we would have a better idea of how good Silicone insulation really is. In addition to drastic thermal aging at 200°C. to 310°C. (590°F.), the test cycle includes exposure to 100% relative humidity for 24 hours followed by a high potential test. Even with such abuse, only one Silicone insulated motor has failed—and that is a most significant failure.

You can do a lot with a margin of 100°C. above the top limit for Class B insulation. Before long that will show up in new designs for motors. Right now standard frame motors rewound with Silicone insulation will give you:

Much greater reliability.
Greater overload protection.
Immunity to ambient temperatures.
Greater moisture resistance.
Reduced fire hazards.

You know how very important reliability, moisture proofness and flame resistance are, especially in mine motors. You can get that extra protection and service by using DC Silicone Insulation.

Instructions on how to apply DC 996 are contained in leaflet No. H 3-6.

See our exhibit at the Coal Convention and Exposition in Cleveland, May 12-16.

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

New York • Chicago • Cleveland • Los Angeles
In Canada: Fiberglas Canada, Ltd., Toronto
In England: Albright and Wilson, Ltd., London

Dow Corning
FIRST IN SILICONES

award was presented by James H. Fulker, superintendent of the Division of Safety and Hygiene, at the 16th annual Allen County Safety Award Dinner. William J. Rogers, director of the State department of public relations, was the principal speaker.

General Detroit Corp. and Boston Woven Hose & Rubber Co. have announced a new marketing arrangement on Boston Woven Hose, under which the General Detroit Corp., and its West Coast subsidiary, the General Pacific Corp., will be national distributors for fire hose manufactured by the Boston Woven Hose & Rubber Co. Boston Woven Hose will continue to be made and sold in its established brands and, in addition, the General Detroit Corp. will also continue to market its own Inner Flex fire hose.

Harnischfeger Corp., Milwaukee, has appointed Ralph D. Holcomb general sales manager to direct the sales of all P&H products. Mr. Holcomb's new post follows 18 years with the P&H organization, his latest position being that of district manager for the San Francisco territory.

Allen & Garcia Co., Chicago, has announced that L. von Perbandt has resigned as vice president and member of the board of directors, terminating an association of 32 years, to devote his time to private interests. Mr. von Perbandt came to Allen & Garcia from Link Belt in 1915 and has held various positions, including those of secretary, treasurer and president, in connection with the company's worldwide operations.

•

Trade Literature

AVAILABLE WITHOUT CHARGE ON REQUEST TO THE MANUFACTURER

Trucks—Four Wheel Drive Auto Co., Clintonville, Wis. Folder No. 462 illustrates the FWD "U" series trucks for heavy-duty service, describes their construction, features and typical applications. Folder No. 461 covers the FWD "M" series 10- and 12-ton trucks.

Pumps—Economy Pumps, Inc., Hamilton, Ohio. Bulletin No. B-1146 describes CS vertically-split-case multi-stage pumps, built for larger capacities ranging from 50 to 200 g.p.m. and restricted to clear-liquid pumping.

Pumps—Byron Jackson Co., Box 2017 Terminal Annex, Los Angeles 54, Calif. Bulletin No. 46-5000 describes the deepwell-turbine-pump and electric-motor unit known as the

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS

Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

PITTSBURGH
KNIFE & FORGE CO.
1421 Reedsdale St., N.S.
Pittsburgh 12, Pa.

SIGN OF QUALITY
MARLO
PACKING for MINE PUMPS
Resists acid mine waters. Keeps grit out of stuffing box. Three types.

• MARLO ALL PURPOSE METALLIC PACKING
Best ever devised. Will not freeze at 70° below, soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

• "TWIN-TWIST" SEMI-METALLIC PACKING
Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressibility. Never hardens. For temperature up to 550° F.

• "RED WATER" SEMI-METALLIC PACKING
Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

THE MARLO COMPANY
38 HOWARD ST.
NEW YORK, N. Y., U. S. A.

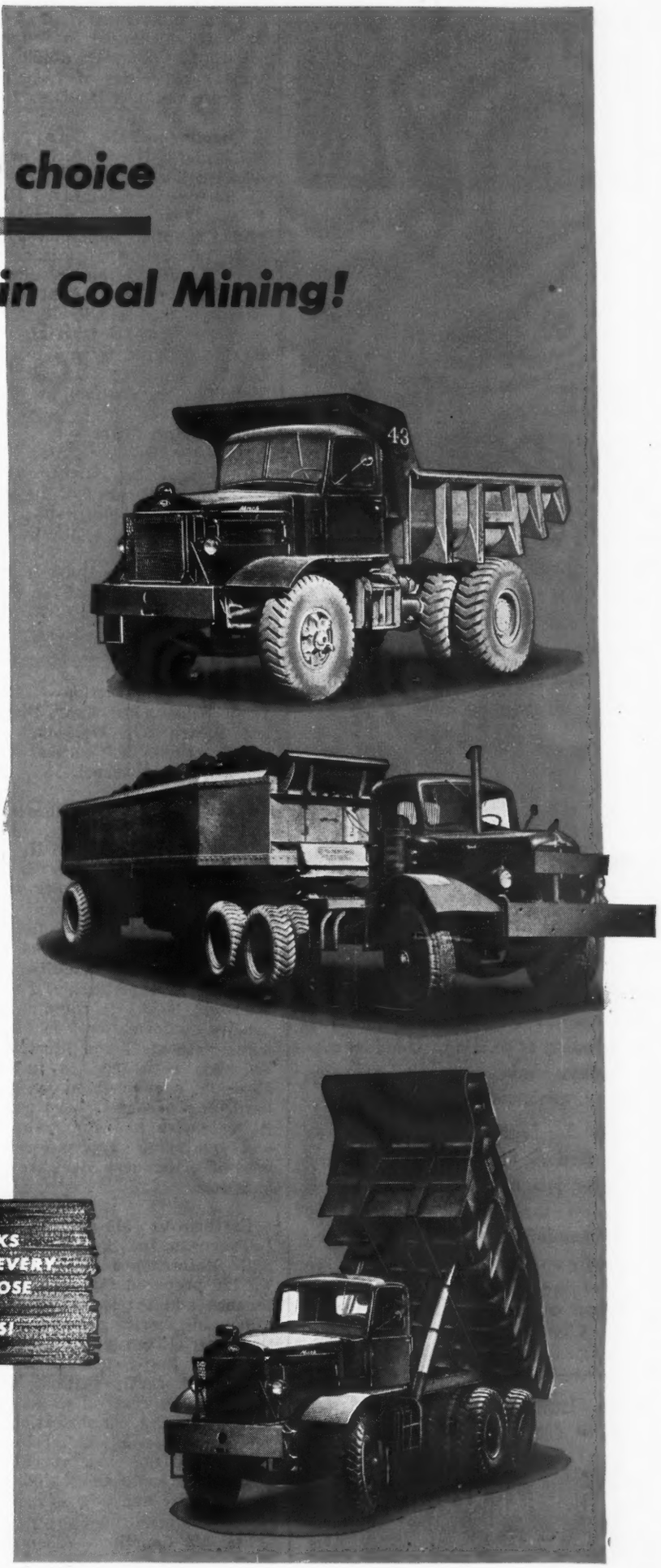
MACK . . . first choice

for the tough jobs in Coal Mining!

Hauling is one of the tough jobs in coal mining. It calls for a tough truck. It calls for a Mack—America's leading heavy-duty truck for 47 years.

Successful operators choose Mack to get things done. Reasons are simple and important to you: Macks are built and engineered specifically for the job. Constant improvements and close manufacturing controls make Macks your best investment. You get more work out of 'em because more work goes into 'em.

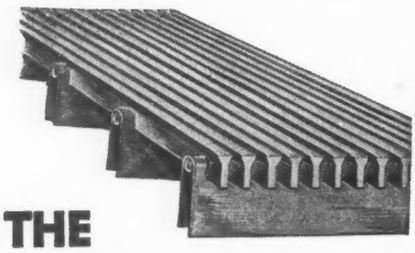
There's a Mack to make your hard work easier, to make your profits bigger.



SEE THE NEW MODELS ON DISPLAY AT THE MACK EXHIBIT—American Mining Congress Coal Convention, Cleveland, Ohio, May 12-15.

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, New York. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

TAPERED FOR
Maximum
EFFICIENCY



THE
WEDGE-BAR
SCREEN

Two Significant Features—

(1) Continuous open slots over entire screen surface without any unperforated area, and

(2) Downward enlargement of slots to draw off moisture, fines.

THE WEDGED SHAPED
PROFILE BAR

Note how the wedge shape permits moisture and undersize to clear quickly. No blinding or packing. U-holder supports have maximum carrying capacity, rigidity, minimum weight.

Wedge-Bar Sections are designed and fabricated to fit your equipment and do your job most efficiently. Send for data sheets so we may make recommendations. Illustrated catalog promptly on request.

**See our exhibit at the Cleveland Show—
Space 1407**

Shaker Jackets • Vibrating Screen Panels • Chutes • Conveyors • Dryers

WEDGE-BAR SCREEN CORP.
640 W. 134 ST., NEW YORK 31, N. Y.

"Submersible Pump," that operates entirely submerged in water at any depth, for pumping applications requiring capacities of 7,000 g.p.m. to 20,000 g.p.m. and heads to 1,500 ft.

Couplings—Falk Corp., Milwaukee 8. Bulletin No. 4100, in addition to detailed illustrations and descriptions of the new and improved Falk Type F Steelflex couplings, contains simplified selection tables for both motor and turbine applications. Falk's new standardization resulting in a wider range of application for one standard type of Steelflex coupling, plus the new selection method used in this bulletin, is said to make for greater accuracy in selection and simplified installation.

Paint, Spray Hose—B. F. Goodrich Co., Akron, Ohio. Catalog leaflet describes hose for paint-spray service and the advantages of its construction in handling oil, paints, lacquers, varnish thinners, synthetic enamels.

Belting—Hewitt Rubber, 240 Kensington Ave., Buffalo 5, N. Y. Folder contains specifications and construction features of Monarch brand transmission belting.

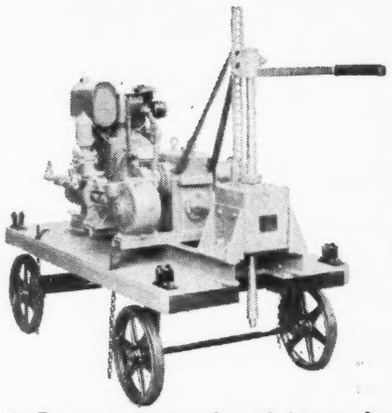
Welding Instruction — Hobart Trade School, Inc., Troy, Ohio. Booklet, "Learn Arc Welding," explains the functions and courses of study pursued at the school.

Manganese Steel—American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill. Bulletin No. 743-M on the applications of manganese steel to mining and quarrying equipment pictures the castings-production facilities of American Manganese Steel Division and the research facilities of the Brake Shoe Experimental Foundry at Mahwah, N. J. It contains comprehensive information on austenitic manganese steel and illustrates how its high resistance to impact and abrasion, supplemented by its work-hardening property, have resulted in its extensive use for many mining and quarrying applications. Many uses of manganese steel are pictured and described.

Earthmover Maintenance — R. G. LeTourneau, Inc., Peoria, Ill. Tournapull Maintenance Wall Chart No. TP-128 prepared especially for maintenance and service men as a quick guide in servicing and lubricating the Super C Tournapull shows at what intervals the Super C Tournapull should be serviced and lists the points to be checked or adjusted at each servicing. Lubrication points are illustrated by 32 labeled photographs and the chart carries recommendations as to what kind of lubricants to use and how often.

Flexible Couplings—Thomas Flexible Coupling Co., Warren, Pa., Engi-

CORE
DRILLS



- Accurate cores of coal seams by using single or double tube core barrels.
- Ideal for determining overburden before strip mining.
- Diamond—alloy or steel shot bits.
- Light weight — easy to move in rough country.

SEND FOR BULLETINS

ACKER DRILL CO.
SCRANTON 3, PA.

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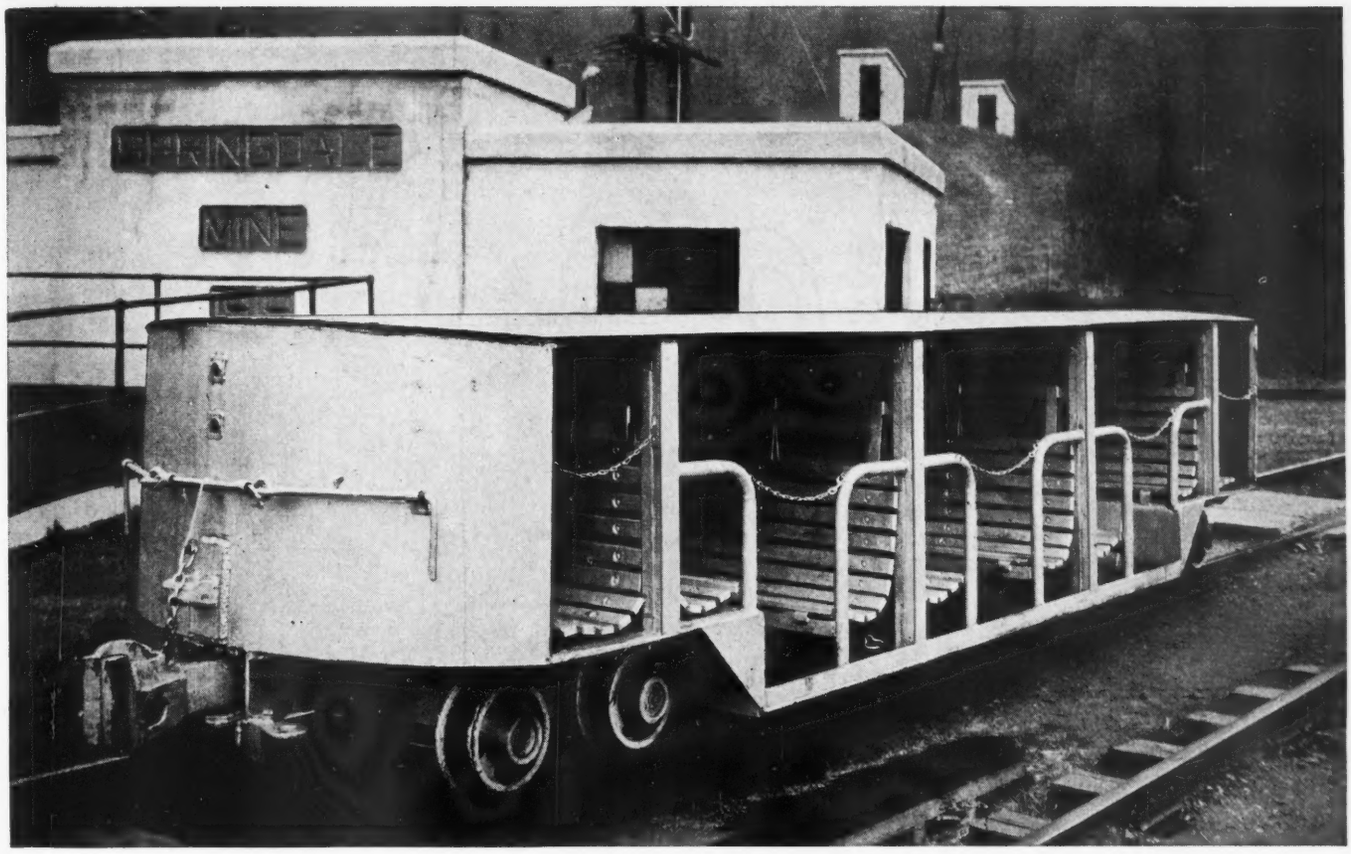


for SPEED, SAFETY and COMFORT

Portal to portal means increased labor costs and the speediest, safest way to assure a minimum time loss is thru man-trip cars—and thus increased production per shift. Man-trip cars also provide that extra margin of safety which should result in decreased liability and insurance costs.

Irwin builds an all-steel, all-welded, 8-wheel man-trip car capable of carrying 30 men—designed to run at top speed with maximum assurance of safety and comfort.

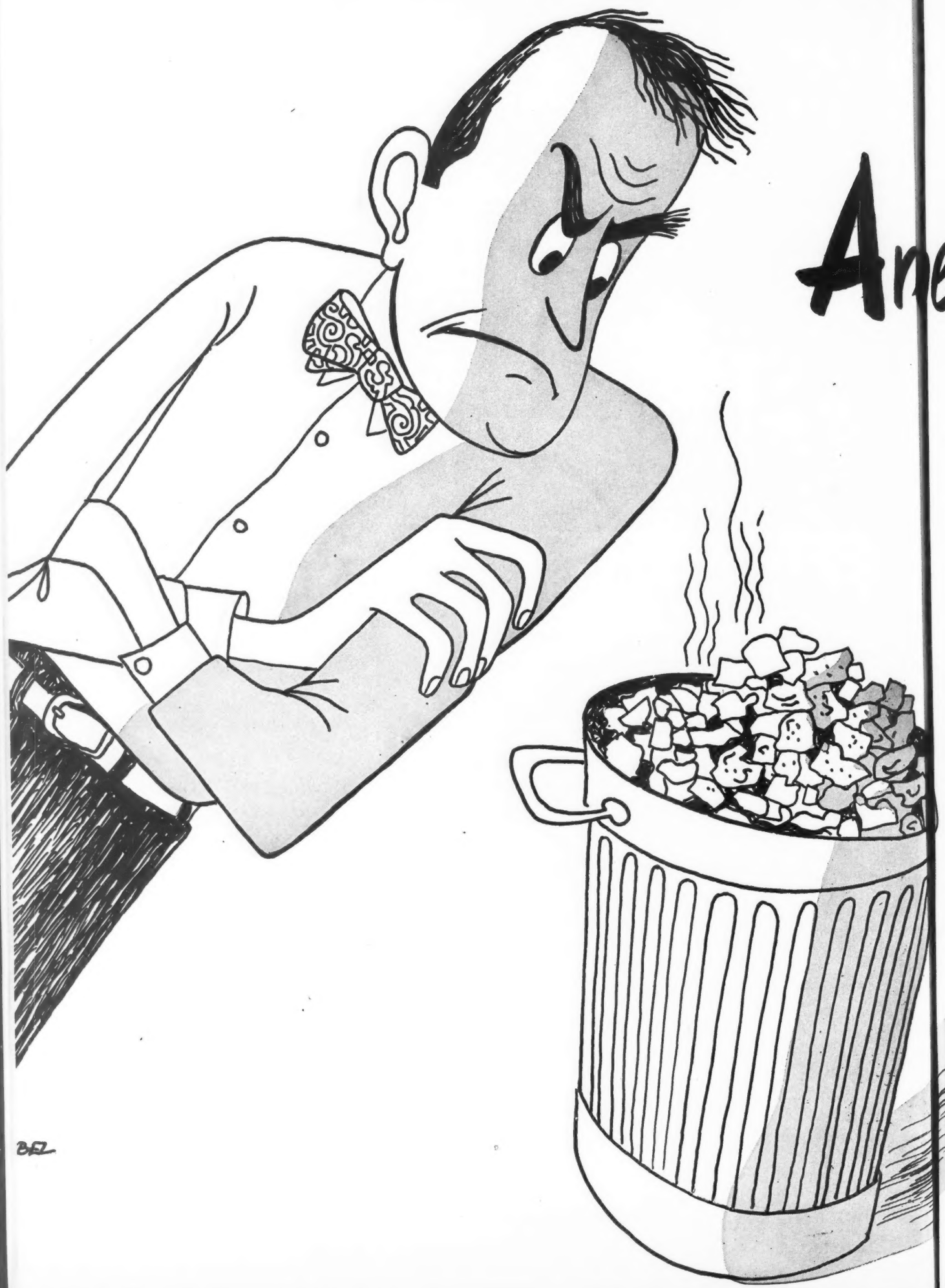
Automatic couplers, safety reflectors, curved wooden seats, solid top, and easy exit are other features.

MAN TRIP CARS

IRWIN

FOUNDRY & MINE CAR CO.

IRWIN, PENNSYLVANIA


Are

Aeople cool about coal?

LOTS of them are. In the minds of many householders, dissatisfaction with coal has been fostered by a feeling:

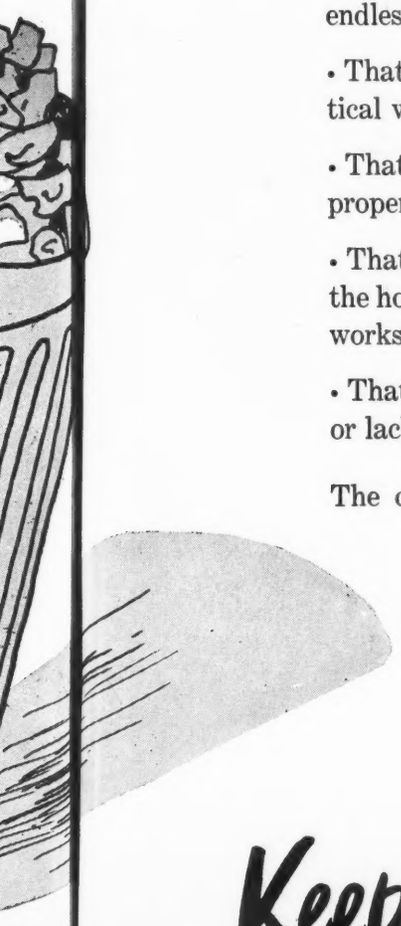
- That coal for house-heating is undependable, dirty, inconvenient.
- That coal stoves are inefficient, smoky, out of date.
- That continued use of coal means an endless ash nuisance.
- That automatic heat control is impractical with coal.
- That too often coal is not available in proper sizes.
- That coal dealers don't care whether the householder's coal-burning equipment works well or not.
- That repair service and parts are lagging or lacking.

The coal industry, through its research and house-heating service activities, is providing effective means of combating these adverse ideas. To overcome them completely will require full co-operation by ALL coal producers, carriers, distributors, and retailers.

Let's all pull together!

The Chesapeake & Ohio Railway is heart and soul in this movement. Chesapeake & Ohio money is helping to finance the necessary research. Chesapeake & Ohio cars and coal-handling equipment are furnished in ample capacity to move coal promptly from mine to market.

For this purpose, Chesapeake & Ohio, as of February 1, 1947, had sixty thousand one hundred and seventy coal cars and nine hundred locomotives in service, plus one thousand and ten coal cars and thirty-five locomotives on order. ALL of these Chesapeake & Ohio locomotives are coal-burning steam locomotives.



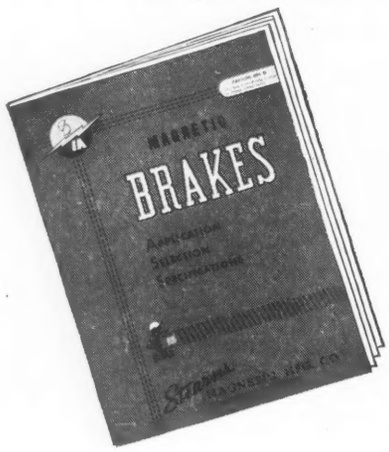
Chesapeake & Ohio Railway

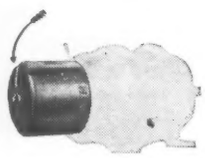
Keep the home fires burning coal

FOR BETTER BRAKE Performance

Consult Stearns Magnetic on your braking problems. Brakes in sizes up to torques of 500 lbs. or the equivalent of 100 hp. at approximately 1,000 rpm. in floor or motor mounting types for AC or DC current. For effective retarding of motors or machinery, whether for one or a sequence of controlled stops, whether for horizontal or vertical mounting. Being satisfactorily used in hundreds of exacting operations.

Ask for our Brake Bulletin.





The magnetic brake with the lining wear indicator and manual release — distinctive, original

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SEPARATORS PULLEYS DRUMS CLUTCHES

neering catatlog contains full engineering details of the Thomas line of flexible couplings, including specifications, capacities, engineering drawings and application data.

Oxygen - Breathing Apparatus — Mine Safety Appliances Co., Thomas and Braddock Sts., Pittsburgh 8. Bulletin describes and illustrates use of the MSA Chemox oxygen-breathing apparatus, a self-contained breathing apparatus in which the wearer is independent of outside air. It is said to afford complete respiratory protection for a minimum of 45 minutes and generates its own oxygen for the wearer, with a replaceable canister.

Diesel Generators — Ready-Power Co., 11231 Freud Ave., Detroit 14. Catalog sheet describes the company's 4½- and 9-kw. diesel-engine generators sold as complete self-contained units.

Safety Circuit Center Power Distribution—Mines Equipment Co., 4215 Clayton Ave., St. Louis 10. Bulletin No. S.C.C. 100 illustrates and describes the company's safety circuit center power distribution systems available in permissible and dust-resistant types. Operation, layouts and specifications of the systems are included.

Earthmovers — Caterpillar Tractor Co., Peoria 8, Ill. Bulletin No. 9782, The "Caterpillar" Line in Action, stresses applications of the entire line of products — diesel-powered track and wheel-type tractors, diesel motor graders, diesel industrial and marine engines and electric sets, bulldozers, scrapers, cable controls and wagons.

Electric Locomotive—Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30. Bulletin No. B-3702 describes the 26-inch-high "Low Liner" locomotive for mining of low-seam coal. Features of the Low Liner, according to the manufacturer, are the flush-frame construction for safety and ample equipment space, roller journal bearings with boxes removable without untrucking, leaf springs for smooth riding, motors with high continuous rating, electro-pneumatic control and heavy-duty resistors.

Air Hose—B. F. Goodrich Co., Akron, Ohio. Catalog section describes the construction and advantages of each type of air hose, outlines applications and gives data on sizes, braids and plies, pounds for 100-ft. lengths, maximum lengths, outside diameters and working pressures.

Flotation Reagents—American Cyanamid Co., 30 Rockefeller Plaza, New York 20. "Mineral Dressing Notes" No. 15 on "Flotation Reagents" is a continuation and revision of "Ore

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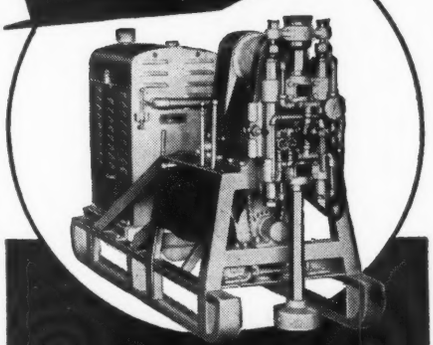

Testing mineral properties with our light gasoline drills. SATISFACTORY COAL CORES GUARANTEED. Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

MOTT CORE DRILLING CO.
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Modernizing Your Mine? . . . Don't Overlook The Cantrell "S-P" Compressor

Cantrell
COMPRESSORS

"Modernize for competition" is the order of the day, and no modern mine is completely equipped without the Cantrell "S-P" Self-Propelled Compressor. One of the most versatile machines on the market, the Cantrell "S-P" efficiently performs as a self-tramming compressor and at the same time takes on extra work as a two-ton locomotive. Jobs like ditch lining, leveling haulways, shifting pumps and mining machines, hauling repairs, riveting and blowing substations are easily handled by the Cantrell "S-P", freeing heavy locomotives and crews for other work.

Imperial-Cantrell builds 5 compressor outfits to meet every requirement of track, trackless or stationary use. One of them will fit your needs at a most reasonable cost. Write or wire us today for information on the complete line of Cantrell Compressors.

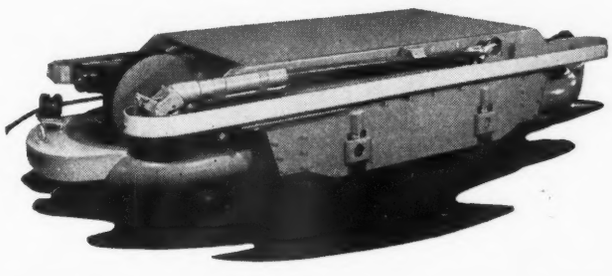

Photo at left shows Cantrell, Type "S-P", Compressor with safety-top in place. Above is a detail view of the "S-P" with safety top removed. A simple shift of a lever changes unit from locomotive to compressor service.

IMPERIAL-CANTRELL MFG. CO., JELLICO, TENNESSEE

NEW LIFE FOR OLD CABLES

7 Point Superiority

1 Double grip . . . both sides adhesive.

2 Great tensile strength . . . tough.

3 Won't tear, ravel or pucker.

4 Resists abrasion.

5 Acid- and alkali-proof.

6 Extra thick . . . one layer insulates.

7 Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

RUBEROID

INSULATING TAPE

The RUBEROID Co., Executive Offices, 500 Fifth Avenue, New York 18, N. Y.

Dressing Notes" No. 7 (1940). Some of the more important developments since 1940 included are descriptions of the "500 Series" reagents, "800 Series" reagents and "600 Series." A new feature in the form of tables giving pertinent information on the best use of reagents, recommended point of addition, amounts required, list of minerals amenable to flotation and other useful data in convenient tabular form is included.

Packing Rings — Raybestos - Manhattan, Inc., Asbestos Textile & Packing Division, Manheim, Pa. Bulletin No. A909 describes "Vee-Flex" automatic packing rings for packing rams, hydraulic presses, hydraulic lifts, accumulators, triplex pumps, telemotors, heavy duty valve stems, and hydraulic cylinders of all types.

Magnetic Crane Control—Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30. Bulletin No. B-3853 outlines five types of a.c. magnetic-crane controls for handling any type of load and contains descriptive information, wiring diagrams, performance curves and an application guide to aid in selecting the type of a.c. control suited to any application.

Stainless Steels—Joslyn Stainless Steels, Fort Wayne 6, Ind. Stainless-steel stock list, published monthly, lists rounds, squares, hexagons, flats, wire and a complete range of angles and channels.

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